BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.95...3.05 : (2.90...3.10) Note remarks Rack travel in mm : 14.00...17.00 Firing order : 1-5- 3- 6- 2- 4 Test sheet : THC Edition : 05,02.93 Reolaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 838 Tolerance + - ° : 0.30 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6P100A320LS3306 EP type number : 0 412 006 703 BASIC SETTING Governor Governor design. : RQV350...1200PA1042K 1st speed rpm: 800 : 0 421 815 320 Governer no. Rack travel in mm : 13.80...13.90 Customer-spec. information Customer : NAVISTAR Del.quantity cm3/: 15.9...16.1 Engine : DTA-466 100 s: (15.7...16.3) 1st version kW : 172.0 Spread cm3 : 0.8Rated speed : 2400 100 s: (1.2) TEST BENCH REQUIREMENTS 2nd speed rpm : 350.0Test oil Rack travel in mm: 5.8...6.0 inlet temp. °C : 38...42 Del.quantity cm3/ : 1.7...2.1 100 s: (1.5...2.4) Overflow valve Spread cm3 : 0.4: 1 417 413 058 100 s: (0.6) Inlet press., bar: 2.80 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 assembly GUIDE SLEEVE TRAVEL 1st speed rpm : 350Opening. : 1.80...2.00 travel mm : 207...210 2nd speed rpm : 500pressure, bar travel mm : 3.50...3.90 Orifice plate 3rd speed rpm : 800 diameter mm : 0,6 travel mm : 6.20...6.60 : 1250 : 9.30...9.50 4th speed rpm travel mm Test lines : 1 680 750 008 5th speed : 1400 rpm : 10.50...11.00 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION : 6.00X2.00X600 x Length mm Control-lever position Degree: -1 rpm : 1440 (A) Injection pump setting values Speed Rack travel in mm : 7.00...13.00 Insp. values in parentheses Set equal delivery quant. per values ____ FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version

Speed

rpm : 800

Aneroid pressure h: 1200

Test pressure, bar: 22...24

Del. auantity : 159.5...161.5 1000 : (157.5...163.5) : 8.00 cm3 Spread 1000 : (12.00) RATED SPEED 1st version Control lever position degrees: 116...124 Testing: 1st rack travel in: 13.60 Speed rpm : 1240...1270 2nd rack travel in: 4.00 rpm : 1435...1445 Speed 4th rack travel in: 1530 rpm : Ü.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 71...79 Testing: Speed rpm : 275 Minimum rack trave: 7.40 rpm : 350 Rack travel in mm : 5.80...6.00 CONSTANT REGULATION Speed rpm : 350...520TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 800 Rack travel in m: 13.80...13.90 and speed rpm : 1200 2nd speed Rack travel in m: 14.60...14.80 3rd speed rpm : 600 Rack travel in m: 12.90...13.30 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 1200 hPa : 1200 Pressure Rack travel mm : 14.50...14.70

Measurement Speed 1/min: 1200 1st pressure hPa : -Rack travel in m: 10.40...10.80 2nd pressure hPa : 300 Rack travel in m: 11.50...11.60 3rd pressure hPa : 660 A02

Rack travel in m: 13.50...13.90 START CUT-OUT 1/min : 290 (300) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1200 Del.quantity cm3/: 160.0...164.0 1000 s: (158.0...166.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 1200 Speed Del.quantity cm3/ : 96.5...100.5 1000 s: (94.5...102.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.60 Speed rpm : 1240...1270 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 120.0...160.0 1000 s: (115.0...165.0) Rack travel in mm : 20.00...21.00 LOW IDLE : 350 Speed rpm Rack travel in mm : 5.80...6.00 Del.quantity cm3/: 17.5...21.5 1000 s: (15.0...24.0)

Spread cm3 : 4.001000 s: (6.50)

Remarks:

: NAVISTAR #1819913c91

Delivery-valve spring pre-tension = 6.00...6.10 mm. Permissible alteration from 5.70...6.30

Bow dimension:

Stiding-sleeve position = 37.0 mm Limit shutoff stop screw to 1.0 mm. Start-of-delivery blocking at start of delivery of cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC

Edition : 03.02.93

Replaces : -

Test oil : ISO-4113

Combination no. : 0 402 046 839

Injection pump

Pump designation : PES6P100A320LS3306

EP type number : 0 412 006 703

Governor

Governor design. : RQV350...1200PA1042-

1K

Governer no. : 0 421 815 322

Customer-spec. information Customer : NAVISTAR

Engine : DTA-466

1st version kW : 172.0

Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 058

Inlet press., bar: 2.80

Overflow

quantity min. 1/h: 240...260

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0.6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

 \times Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.95...3.05

: (2.90...3.10)

Rack travel in mm : 14.00...17.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 800

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 16.1...16.3

100 s: (15.9...16.5)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 350.0 Rack travel in mm : 5.9...6.1 Del.guantity cm3/: 1.5...1.9

100 s: (1.2...2.1)

Spread cm3 : 0.4 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

2nd speed rpm : 500

travel mm : 3.50...3.90

3rd speed rpm : 800

travel mm : 6.20...6.60

4th speed rpm : 1250

travel mm : 9.30...9.50

5th speed rpm: 1400

travel mm : 10.50...11.00

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 Speed rpm : 1440

Rack travel in mm : 7.00...13.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 800 Aneroid pressure h: 1200 : 161.5...163.5 Del.quantity 1000 : (159.5...165.5) : 8.00 Spread cm3 1000 : (12.00) RATED SPEED 1st version Control lever position degrees: 113...121 Testina: 1st rack travel in: 13.30 rpm : 1240...1270 Speed 2nd rack travel in: 4.00 rpm : 1430...1440 Speed 4th rack travel in: 1530 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 71...79 Testing: Speed rpm : 275 Minimum rack trave: 7.70 rpm : 350 Speed Rack travel in mm : 5.90...6.10 CONSTANT REGULATION Speed rom : 350...520TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 800 Rack travel in m: 14.00...14.10 nd speed rpm : 1200 2nd speed Rack travel in m: 14.30...14.50 3rd speed rpm : 650 Rack travel in m: 13.40...13.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1200 rpm Pressure hPa : 1200 : 14.30...14.50 Rack travel mm Measurement 1/min: 1200 Speed

Rack travel in m: 10.30...10.70 2nd pressure hPa : 310 Rack travel in m: 11.20...11.30 3rd pressure hPa : 655 Rack travel in m: 13.00...13.40 START CUT-OUT 1/min: 290 (300) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 1200 Del.quantity cm3/: 156.5...160.5 1000 s: (154.5...162.5) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: rpm : 800 Speed Del.quantity cm3/: 85.0...89.0 1000 s: (83.0...91.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.30 Speed rpm : 1240...1270 STARTING FUEL DELIVERY Speed : 100 rpm Del.quantity cm3/: 120.0...160.0 1000 s: (115.0...165.0) Rack travel in mm : 20.00...21.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 15.0...19.0 1000 s: (12.5...21.5) cm3 : 4.00 1000 s: (6.50) Spread Remarks: : NAVISTAR #1819914c91 Delivery-valve spring pre-tension = 6.00...6.10 mm. Permissible alteration from 5.70...6.30

Bow dimension:

1st pressure hPa : -

Sliding-sleeve position = 37.0 mm Limit shutoff stop screw to 1.0 mm.

Start-of-delivery blocking at start of delivery of cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : IHC

Edition : 03.02.93

Replaces

Test oil : ISO-4113

Combination no. : 0 402 046 845

Injection pump

Pump designation : PES6P100A320LS3309

EP type number : 0 412 006 704

Governor

: RQV350...1300PA1042-Governor design.

: 0 421 815 320 Governer no.

Customer-spec. information Customer : NAVISTAR

Engine : DTA-408

1st version kw : 142.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 058

Inlet press., bar: 2.80

Overflow

quantity min. 1/h: 240...260

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.95...3.05

: (2.90...3.10)

Rack travel in mm : 14.00...17.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 900

Rack travel in mm : 12.10...12.20

Del.quantity cm3/: 13.6...13.8

100 s: (13.4...14.0)

cm3 : 0.8Spread

100 s: (1.2)

2nd speed rpm : 350.0Rack travel in mm : 5.4...5.6

Del.quantity cm3/: 1.3...1.7 100 s: (1.0...1.9)

Spread cm3 : 0.4100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.60...2.00 travel mm

rpm : 500 2nd speed

: 3.80...4.20 travel mm

rpm : 800 3rd speed

travel mm : 5.80...6.20

rpm : 13004th speed

: 8.90...9.10 travel mm

rpm : 1500 5th speed

: 10.40...10.80 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1500

Rack travel in mm : 8.00...14.00

FULL LOAD DELIV. AT FULL LOAD STOP

Rack travel in m: 9.50...9.90 1st version 2nd pressure hPa : 250 Rack travel in m: 10.30...10.40 3rd pressure hPa : 600 Speed rpm : 900 Aneroid pressure h: 1200 Del.quantity : 750.5...140.5) Rack travel in m: 11.60...12.00 cm3 : 8.00 Spread START CUT-OUT 1000 : (12.00) Speed 1/min : 290 (300) RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 112...120 1st version Ameroid pressure h: 1200 Speed Testing: rpm : 1300Del.quantity cm3/: 134.0...138.0 1000 s: (132.0...140.0) Spread cm3: 8.00 1st rack travel in: 11.40 rpm : 1340...1370 Speed 2nd rack travel in: 4.00 rpm : 1500,..1510 Speed 1000 s: (12.0) 4th rack travel in: 1530 Aneroid pressure h: -Speed rpm : 0.00...1.00 Speed rpm : 1300Del.quantity cm3/: 87.0...91.0 1000 s: (85.0...93.0) LOW IDLE 1 Control Lever position degrees: 71...79 BREAKAWAY Testing: Speed rpm : 275 1st version Minimum rack trave: 6.00 1mm rack travel less than : 350 rpm Rack travel in mm : 5.40...5.60 full load rack tr: 11.40 rpm : 1340...1370 Speed CONSTANT REGULATION rpm : 350...520 Speed STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm :? : 100 Speed rpm Torque control curve - 1st version Del.quantity cm3/: 120.0...160.0 rpm : 900 1000 s: (115.0...165.0) 1st speed Rack travel in m: 12.10...12.20 Rack travel in mm : 20.00...21.00 rpm : 1300 2nd speed Rack travel in m: 12.40...12.60 LOW IDLE 3rd speed rpm : 700 Speed rpm : 350 Rack travel in mm : 5.40...5.60 Del.quantity cm3/ : 13.0...17.0 Rack travel in m: 11.40...11.80 Aneroid/Altitude Compensator Test 1000 s: (10.5...19.5) Spread cm3 : 4.001000 s: (6.50) 1st version Setting Remarks: Speed : 1200 rom : NAVISTAR #1819922C91 hPa : 1200 Pressure Rack travel mm : 12.40...12.60 Bow dimension: Sliding-sleeve position = 37.0 mmMeasurement Limit shutoff stop screw to 1.0 mm. 1/min: 1200 Speed 1st pressure hPa : -Start-of-delivery blocking at start of

80A

delivery of cylinder no. 1.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.50...3.60 Prestroke mm (3.45...3.65) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Test sheet : AIF Edition : 11.61.93 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 046 847 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6P120A720RS3316 EP type number : 0 412 026 761 BASIC SETTING Governor Governor design. : RQV300...1200PA1045 1st speed rpm: 1200 Governer no. : 0 421 814 043 Rack travel in mm : 13.90...14.00 Customer-spec. information : IVECO-AIFO Del.quantity cm3/ : 24.3...24.5 Customer : 8361 SRM 37 Engine 100 s: (24.0...24.8) 1st version kW : 272.0 cm3 : 0.5Spread Rated speed : 2400 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0Test oil Rack travel in mm : 3.0...3.4 Rack travel in mm . 3.3...2.9 Del.quantity cm3/ : 2.3...2.9 100 s: (2.0...3.2) inlet temp. °C : 38...42 Overflow valve Spread cm3 : 0.8: 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 105 assembly GUIDE SLEEVE TRAVEL rpm : 1245 1st speed Openina travel mm : 7.60.,,7,80 : 207...210 rpm : 300 pressure, bar 2nd speed : 0.70...0.90 travel mm Orifice plate rpm : 700 3rd speed : 3.20...3.80 diameter mm : 0,8 travel mm 4th speed rpm : 1550 travel mm : 11.00...12.00 Test lines : 1 680 750 089 GUIDE SLEEVE POSITION Outside diameter Control-lever position x Wall thickness Degree: -1 : 8.00X2.50X600 rpm : 1360 x Length mm Speed Rack travel in mm : 11.60...14.20 (A) Injection pump setting values Insp. values in parentheses FULL LOAD DELIV. AT FULL LOAD STOP Set equal delivery quant. per values ____ 1st version Speed rpm : 1200 BEGINNING OF DELIVERY Aneroid pressure h: 900 Del.quantity : 243.0...248.0)

Test pressure, bar: 25...27

Spread cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 111...119

Testing:

1st rack travel in: 12.90

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1365...1395

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 57...65

Testing:

Speed rpm : 300 Minimum rack trave: 4.70 Speed rpm : 300

Rack travel in mm : 3.10...3.30

Rack travel in mm : 2.00 Speed rpm : 355...415

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 500 Pressure hPa : 900

Rack travel mm : 13.90...14.00

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: **8.6**0...8.80

2nd pressure hPa : 440

Rack travel in m: 12.60...12.70

3rd pressure hPa : 320

Rack travel in m: 9.90...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 Speed rpm : 750

Del.quantity cm3/: 267.0...273.0

1000 s: (264.0...276.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/: 151.0...153.0 1000 s: (148.0...156.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 1240...1250

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB

Edition : 03.62.93

Replaces : -

Test oil : 150-4113

Combination no. : 0 402 065 700

Injection pump

Pump designation : PESSP110A720/3LS3218

-

EP type number : 0 412 015 703

Governor

Governor design. : RSV350...1100P0A487-

7

Governer no. : 0 421 833 314

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M449

1st version kW : 140.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 0 681 343 009

Opening.

pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.30...4.40 : (4.25...4.45)

Rack travel in mm : 9.00...12.00

Firing order : 1-3-5-4-2

Phasing : 0-72-144-216-288

Phasing

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 5

BASIC SETTING

1st speed rpm: 1080

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 13.5...13.7

100 s: (13.2...13.9)

Spread cm3 : 0.4

100 s: (0.8)

2nd speed rpm : 350.0 Rack travel in mm : 6.3...6.7

Del.quantity cm3/ : 1.2...1.8

100 s: (0,9...2.0)

Spread cm3 : 0.4 100 s: (0.7)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 1080

Del.quantity : 135.0...137.0

1000 : (132.5...139.5)

Spread cm3 : 4.00

1000 : (8.00)

RATED SPEED

1st version

Control lever

position degrees: 93...101

Testing: 1st rack travel in: 9.80 rpm : 1130...1140 Speed 2nd rack travel in: 4.00 Speed rpm : 1190...1220 4th rack travel in: 1250 rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 70...78 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm: 6.5 Testing: rpm : 100 Speed Minimum rack trave: 19.50 Speed rpm : 350 Rack travel in mm : 6.30...6.70 Rack travel in mm: 2.00 Speed : 400...460 התכרו SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 600 Del.quantity_cm3/ : 111.0...115.0 1000 s: (108.0...118.0) cm3 : 6.00Spread 1000 s: (9.00) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 9.80 rpm : 1130...1140 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 140.0...160.0 1000 s: (136.0...164.0) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : DEE : 11.01.93 Edition Replaces : 10.92 Test oil : 150-4113 Combination no. : 0 402 076 745 Injection pump Pump designation : PES6P120A720RS3203 EP type number : 0 412 026 728 Governor Governor design. : RSV625...1100P2A534 : 0 421 833 372 Governer no. Customer-spec, information Customer : JOHN DEFRE : 6076 HZ 031 Engine 1st version kW : 205.0 Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 457 413 010 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 101 Openina . pressure, bar : 207...210 Orifice plate diameter mm : 0,6 Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00X3.00X600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

: 3.55...3.65 Prestroke mm : (3.50...3.70) Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4 Phasina : 0-60-120-180-240-300 Tolerance $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 12.70...12.90 Del.quantity cm3/: 17.4...17.6 100 s: (17.2...17.8) Spread cm3 : 0.4100 s: (0.6) 2nd_speed_ rom : 625.0Rack travel in mm : 5.4...5.6 Del.guantity cm3/: 2.7...3.1 100 s: (2.4...3.3) cm3 : 0.6 Spread 100 s: (0.8) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting \bar{x} : 4.50 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100Aneroid pressure h: 1200 : 174.5...176.5 Del.quantity 1000 : (172.5...178.5) : 4.00 Spread cm3 1000 : (6.50) RATED SPEED 1st version Control lever position degrees: 42...50

per values ____

Test pressure, bar: 27...29

BEGINNING OF DELIVERY

Testing:

1st rack travel in: 11.70

Speed rpm : 1140...1150 2nd rack travel in: 4.00

rpm : 1205...1215 Speed

3rd rack travel in: 4.00

rpm : 1195...1225 Speed

4th rack travel in: 1350

rom : 0.30...1.40Speed

LOW IDLE 1

Control lever

position degrees: 22...30

Setting point w/out bumper spring

rpm : 625 Rack travel in mm: 5.0

Testing:

rpm : 100 Speed

Minimum rack trave: 19.00

: 625 rpm

Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 12.70...12.80

2nd speed rpm : 700

Rack travel in m: 13.30...13.50

Aneroid/Altitude Compensator Test

1st version Setting

Speed rom

rpm : 500 hPa : 1200 Pressure

Rack travel mm : 13.30...13.50

Measurement

1/min : 500Speed

1st pressure hPa : -

Rack travel in m: 11.60...11.80

2nd pressure hPa : 645

Rack travel in m: 12.10...12.20

3rd pressure hPa : 840

Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 700 rpm

Del.quantity cm3/: 187.0...191.0

1000 s: (185.0...193.0)

Aneroid pressure h: -

rpm : 800 Speed

Del.quantity cm3/: 143.0...147.0

1000 s: (141.0...149.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 90.0...110.0

1000 s: (85.0...115.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 625
Rack travel in mm : 5.40...5.60
Del.quantity cm3/: 27.0...31.0
1000 s: (24.5...33.5)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47399

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

A15

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : LIE : 11.01.93 Edition Replaces : 08.92 Test oil : ISO-4113 Combination no. : 0 402 076 748 Injection pump Pump designation : PES6P110A720RS3305 EP type number : 0 412 016 740 Governor Governor design. : RSV300...1100P1A555 : 0 421 833 379 Governer no. Customer-spec. information Customer : LIEBHERR : D 926 TI Engine : 210.0 1st version kW Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening. : 172...175 pressure, bar Test lines : 1 680 750 089 Outside diameter x Wall thickness x Length mm : 8.00x2.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____ BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 9.00...12.00 A16

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 15.40...15.50 Del.quantity cm3/: 18.5...18.7 100 s: (18.2...18.9) Spread cm3 : 0.4100 s: (0.7) 2nd speed rpm : 400.0 Rack travel in mm: 7.3...7.5Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8) Spread cm3 : 0.4100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x :? FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1300 Del.quantity : 185.0...187.0 1000 : (182.5...189.5) cm3 : 4.00 1000 : (7.50) Spread RATED SPEED 1st version Control lever position degrees: 96...104 Testina: 1st rack travel in: 14.40 Speed rpm: 1040...1050 2nd rack travel in: 4.00

: 1080...1110 Speed rpm 3rd rack travel in: 4.00 : 1115...1145 Speed com 4th rack travel in: 1260 rom : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 69...77 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm: 6.9 : 400 rom Rack travel in mm : 7.30...7.50 Rack travel in mm : 2.00 Speed rpm : 560...620 TORQUE CONTROL Torque control curve - 1st version rpm : 1000 1st speed Rack travel in m: 15.40...15.50 rpm : 500 2nd speed Rack travel in m: 15.40...15.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 550 rpm hPa .: 1300 Pressure Rack travel mm : 15.40...15.50 Measurement 1/min : 550 Speed 1st pressure hPa : -Rack travel in m: 13.40...13.60 2nd pressure hPa : 510 Rack travel in m: 13.70...13.80 3rd pressure hPa : 640 Rack travel in m: 14.90...15.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 550 Del.quantity cm3/: 149.0...151.0 1000 s: (146.5...153.5) BREAKAWAY

Speed rpm : 1040...1050 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 145.0...165.0 1000 s: (141.0...169.0) Rack travel in mm : 20.00...21.00 LOW IDLE rpm : 400 Speed Rack travel in mm : 7.30...7.50 Del.quantity cm3/: 10.0...16.0 1000 s: (7.5...18.5) Spread cm3 : 4.501000 s: (7.50) Remarks:

A17

1st version

1mm rack travel less than

full load rack tr: 14.40

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : LIE : 11.01.93 Edition Replaces : 08.92 Test oil : ISO-4113 Combination no. : 0 402 076 748A Injection pump Pump designation : PES6P110A720RS3305 : 0 412 016 740 EP type number Governor Governor design. : RSV300...1100P1A555 : 0 421 833 379 Governer no. : 9271058 Cust. part no. Customer-spec. information Customer : LIEBHERR Engine : D 926 TI 1st version kW : 210.0 Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly Opening 1 pressure, bar : 172...175 Test lines : 1 680 750 089 Outside diameter

Opening
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter
x Wall thickness
x Length mm : 8.00x2.50x600

(A) Injection pump setting values
Insp. values in parentheses
Set equal delivery quant.
per values

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

: 3.50...3.60 Prestroke mm (3.45.,.3.65) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 15.40...15.50 Del.quantity cm3/: 18.5...18.7 100 s: (18.2...18.9) Spread cm3 : 0.4100 s: (0.7) rpm : 400.02nd speed Rack travel in mm: 7.3...7.5 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.8) cm3 : 0.4Spread 100 s: (0.7) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x :? FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1300 : 185.0...187.0 Del.quantity 1000 : (182.5...189.5) : 4.00 Spread cm3 1000 : (7.50) RATED SPEED 1st version Control lever position degrees: 96...104

Testing:

1st rack travel in: 14.40 Speed rpm : 1040...10502nd rack travel in: 4.00 Speed rpm : 1080...1110 3rd rack travel in: 4.00 rpm : 1115...1145 Speed 4th rack travel in: 1260 Speed rpm : 0.30...1.40LOW IDLE 1 Control lever position degrees: 69...77 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm: 6.9 rpm : 400 Speed Rack travel in mm : 7.30...7.50 Rack travel in mm : 2.00 Speed rpm : 560...620 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 15.40...15.50 2nd speed inpm : 500 Rack travel in m: 15.40...15.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 550 rpm Pressure hPa : 1300 : 15.40...15.50 Rack travel mm Measurement Speed $1/\min : 550$ 1st pressure hPa : -Rack travel in m: 13.40...13.60 2nd pressure hPa : 510 Rack travel in m: 13.70...13.80 3rd pressure hPa : 640 Rack travel in m: 14.90...15.10 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: rpm : 550 Del.quantity cm3/: 149.0...151.0 1000 s: (146.5...153.5)

1mm rack travel less than

full load rack tr: 14.40 Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 145.0...165.0 1000 s: (141.0...169.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 400

Rack travel in mm : 7.30...7.50 Del.quantity cm3/ : 10.0...16.0

1000 s: (7.5...18.5)

Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

BREAKAWAY

1st version

A19

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: DEE

Edition

: 11.01.93

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 076 752

Injection pump

Pump designation : PES6P110A720RS3144

EP type number

: 9 410 231 035

Governor

Governor design.

: RSV400...1050P0A513

Governer no.

: 0 421 833 339

Customer-spec. information

Customer

: JOHN DEERE

Engine

: 6619 A

1st version kW

: 215.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening.

pressure, bar

: 172...175

Test lines

: 9 681 271 004

Outside diameter

x Wall thickness

x Length mm

: 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm

: 3.45...3.55

: (3.40...3.60)

Phasing

Rack travel in mm : 9.00...12.00

Firing order : 1 - 5 - 3 - 6 - 2 - 4

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm : 1050

Rack travel in mm : 13.60...13.70

Del.guantity cm3/: 21.7...21.9

100 s: (21.5...22.1)

Spread

cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 5.8...6.0 Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.6)

Spread

cm3 : 0.4

100 s: (0.7)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 900

Del.quantity

: 217.0...219.0 1000 : (215.0...221.0)

: 4.00 cm3

1000 : (7.50)

RATED SPEED

Spread

1st version

Control lever

position degrees: 41...49

Testina:

1st rack travel in: 12.60

Speed

rpm : 1100...1110

A20

2nd rack travel in: 4.00

Speed rpm : 1180...1190
3rd rack travel in: 4.00

rpm : 1170...1200 Speed

4th rack travel in: 1280

Speed rpm : 0.30...1.40

LOW IDLE 1

Control Lever

position degrees: 19...27

Setting point w/out bumper spring

Speed rpm : 400 Rack travel in mm: 5.4

Testing:

Speed : 100 rpm Minimum rack trave: 19.00 rpm Speed : 400

Rack travel in mm : 5.80...6.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 13.60...13.70

rpm : 750 2nd speed

Rack travel in m: 14.40...14.60

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 500 rpm Pressure hPa : 900

: 14.40...14.60 Rack travel mm

Measurement

Speed $1/\min : 500$

1st pressure hPa : -

Rack travel in m: 11.20...11.40

2nd pressure hPa : 240

Rack travel in m: 12.10...12.50 3rd pressure hPa : 720

Rack travel in m: 14.00...14.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 600 rpm : 750 Speed

Del.quantity cm3/: 229.0...233.0 1000 s: (227.0...235.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/: 158.0...162.0

1000 s: (156.0...164.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 1100...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 170.0...190.0

1000 s: (166.0...194.0)

LOW IDLE

Speed rpm : 400

Rack travel in mm : 5.80...6.00 Del.quantity cm3/ : 20.0...24.0 1000 s: (17.5...26.5)

Spread cm3 : 4.50

1000 s: (7.50)

Remarks:

: JOHN DEERE # RE23749

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark 13° cam angle after start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 1 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

APPLICATION

Tractor (tractor engines)

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE

Edition : 11.01.93

Replaces

Test oil : ISO-4113

Combination no. : 0 402 076 753

Injection pump

Pump designation : PES6P12DA72DRS3203

EP type number

: 0 412 026 728

Governor

Governor design. : RSV400...1100P2A534

-13

: 0 421 833 403 Governer no.

Customer-spec. information

Customer : JOHN DEERE

Engine : 6076 AF & HF

1st version kW : 186.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Openina .

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

: 6.00x3.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65 : (3.50...3.70)

Rack travel in mm : 10.50

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom: 1100

Rack travel in mm : 12.20...12.30

Del.quantity cm3/: 15.5...15.7

100 s: (15.3...15.9)

Spread cm3 : 0.4

100 s: (0.6)

2nd speed rpm : 400.0Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 2.5...2.9 100 s: (2.3...3.2)

Spread cm3 : 0.6

100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension Click setting x : 4.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 1200

: 155.0...157.0 Del.quantity

1000 : (153.0...159.0)

: 4.00 Spread cm3

1000 : (6.50)

RATED SPEED

1st version Control lever

position degrees: 44...52

Testing: 1st rack travel in: 11.20 Speed rpm : 1150...1160 2nd rack travel in: 4.00 rpm : 1225...1235 Speed 3rd rack travel in: 4.00 rpm : 1220...1250 Speed 4th rack travel in: 1400 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 20...28 Setting point w/out bumper spring rpm : 400 Rack travel in mm: 5.1 Testina: rpm : 100 Speed Minimum rack trave: 19.00 rpm : 400 Rack travel in mm : 5.50...5.70 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 12.20...12.30 2nd speed rpm : 650 Rack travel in m: 13.40...13.60 Aneroid/Altitude Compensator Test. 1st version Setting Speed : 500 rpm hPa : 1200 Pressure : 13.40...13.60 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : -Rack travel in m: 10.60...10.80 2nd pressure hPa : 590 Rack travel in m: 11.30...11.70 3rd pressure hPa : 850 Rack travel in m: 12.70...12.80 FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200 rpm : 650 Speed Del.quantity cm3/: 187.0...191.0 1000 s: (185.0...193.0) Aneroid pressure h: -Speed rpm A23

Del.quantity cm3/: 118.0...122.0 1000 s: (116.0...124.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.20

rpm : 1150...1160

STARTING FUEL DELIVERY

rpm : 100 Speed Del.quantity cm3/: 90.0...110.0 1000 s: (85.0...115.0) Rack travel in mm : 20.00...21.00

LOW IDLE

Speed

Speed rpm : 400 Rack travel in mm : 5.50...5.70 Del.quantity cm3/ : 25.5...29.5 1000 s: (23.0...32.0) Spread cm3 : 6.001000 s: (8.00)

Remarks:

: JOHN DEERE # RE50748

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark 10.5° cam angle after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : DEE

Edition : 11.61.93

Replaces

Test oil : ISO-4113

Combination no. : 0 402 076 754

Injection pump

Pump designation : PES6P120A720RS3203

EP type number : 0 412 026 728

Governor

Governor design. : RSV4CO...1100P2A534

-14

Governer no. : 0 421 833 405

Customer-spec. information

Customer : JOHN DEERE

Engine : 6076 HF030

1st version kW : 205.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 101

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00X3.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65 : (3.50...3.70)

Rack travel in mm : 10.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 12.50...12.60

Del.quantity cm3/: 16.8...17.0

100 s: (16.6...17.2)

Spread cm3 : 0.4

100 s: (0.6)

rpm : 400.0 2nd speed Rack travel in mm : 5.2...5.4 Del.quantity cm3/: 2.0...2.4

100 s: (1.8...2.6)

Spread cm3 : 0.6100 s: (0.8)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...0.70

Governor spring pre-tension Click setting x : 2.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100 Aneroid pressure h: 1200

Del.quantity : 100.0...172.0)

: 4.00 Spread cm3

1000 : (6.50)

RATED SPEED

1st version

Control lever

position degrees: 36...44

Testing: 1st rack travel in: 11.50 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 Speed rpm : 1185...1195 3rd rack travel in: 4.00 Speed rpm: 1185...1215 4th rack travel in: 1300 rpm : 0.30...1.40Speed LOW IDLE 1 Control Lever position degrees: 12...20 Setting point w/out bumper spring Speed rpm : 400 Rack travel in mm: 4.8 Testing: Speed : 100 וחסח Minimum rack trave: 19.00 rpm : 400 Rack travel in mm : 5.20...5.40 TORQUE CONTROL Torque control curve - 1st version st speed rpm : 1100 Rack travel in m: 12.50...12.60 1st speed 2nd speed rpm : 750 Rack travel in m: 13.00...13.20 Aneroid/Altitude Compensator Test

1st version Setting Speed : 500 rpm Pressure hPa : 1200 Rack travel mm : 13.00...13.20

Measurement Speed 1/min: 500

1st pressure hPa : -Rack travel in m: 10.70...10.90 2nd pressure hPa : 465 Rack travel in m: 11.10...11.20

3rd pressure hPa : 730

Rack travel in m: 12.20...12.60

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200 rpm : 750 Del.quantity cm3/ : 174.5...178.5 1000 s: (172.5...180.5) Aneroid pressure h: -Speed MCC : 800

Del.quantity cm3/: 117.5...121.5 1000 s: (114.5...124.5)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.50 rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 90.0...110.0 1000 s: (85.0...115.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm: 400 Rack travel in mm: 5.20...5.40 Del.quantity cm3/: 20.0...24.0 1000 s: (18.0...26.9)

Spread cm3 : 6.00 1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47410

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control spring retainer.

Starting/full-load transition speed from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam rotation angle after start of delivery, cylinder 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MTU Edition : 11.2.93 Replaces Test oil : ISO-4113 Combination no. : 0 402 436 042 Injection pump Pump designation : PE6ZW150/120RS1007 Governor Governor design. : RQUV300...1200ZWA50R Governer no. : 0 422 409 026 Customer-spec. information : MTU Customer Engine : 331 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 40...45 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 0 681 443 022 assembly Opening | : 172...175 pressure, bar : 1 680 750 027 Test lines Outside diameter x Wall thickness x Length mm : 8,00x2,00x1500 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Tolerance $+ - \circ : 0.50 (0.75)$ BASIC SETTING 1st speed rpm : 1000 Rack travel in mm : 18.00 Del.quantity cm3/: 49.7...50.7 100 s: (49.4...51.0) cm3 : 1.5Spread 100 s: (2.2) rpm : 600 2nd speed Rack travel in mm : 9.00 Del.quantity cm3/: 13.1...15.1 100 s: (12.6...15.6) Spread cm3 : 1.6100 s: (2.4) 3rd speed rpm : 300 Rack travel in mm: 9.00 Del.quantity cm3/: 7.0...9.0 100 s: (6.5...9.5) cm3 : 1.0 Spread 100 s: (1.5) GUIDE SLEEVE POSITION Control-lever position Degree: 82...88 rpm : 1200 Speed Rack travel in mm : 17.5...18.5 RATED SPEED 1st version Control lever position degrees: 82...88 Testina: 1st rack travel in: 17.00 rpm : 1230...1240 Speed 3rd rack travel in: 6.40...11.60 Speed rpm : 1300 4th rack travel in: 1420 rpm : 0.00...2.00 Speed LOW IDLE 1 Control lever position degrees: 20.0...26.0 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 8.00 Testing: Speed rpm : 150 Minimum rack trave: 15.20

: 0-75-120-195-240-315

Phasing

per values ___

Rack travel in mm: 12.00

: 2.50...2.60

: 6-1-2-3-4-5

: (2.45...2.65)

BEGINNING OF DELIVERY

Prestroke mm

firing order

: 400 rpm

Rack travel in mm: 2.80...4.30
Rack travel in mm: 3.80
Speed rpm: 380...420
Speed rpm: 570 Maximum rack trave: < 0.01

LOW IDLE 2 Control lever

position degrees: 27...33

Testing:

Speed rpm : 250
Rack travel in mm : 12.2...14.6
Speed rpm : 375

Rack travel in mm : 6.00...7.20

: 600 Speed rpm

Rack travel in mm: 0.80...2.10

Speed : 730 rpm Rack travel in mm: <0.01

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 17.00

Speed rpm : 1230...1240

Remarks:

Full-load delivery is set on engine according to engine test report.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 21,0 b3 : 18.12.92 Edition : 06.91 Replaces Test oil : ISO-4113 Combination no. : 0 402 640 830 Injection pump Pump designation : PE12P12OA52OLS7824-2 EP type number : 0 412 620 816 Governor Governor design. : RQV300...1150PA902-4 : 0 421 813 870 Governer no. Customer-spec. information Customer : MAN Engine : D2842LYE 1st version kW : 735.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 : 1 680 750 075 Test Lines Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values ____

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

Prestroke mm : 4.50...4.60 : (4.45...4.65) Rack travel in mm : 9.00...12.00 Firing order : 12-1-5-9-8-3-4-11-10-2-6-7 : 0-45-60-105-120-165-Phasing 180-225-240-285-300-: 345 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 12 BASIC SETTING 1st speed rpm: 1150Rack travel in mm : 13.70...13.80 Del.quantity cm3/: 30.4...30.6 100 s: (30.1...30.9) cm3 : 0.5Spread 100 s: (0.9) rpm : 5002nd speed Rack travel in mm: 9.1...9.3 Del.auantity cm3/: 14.9...15.1 100 s: (14.6...15.4) cm3 : 0.8 Spread 100 s: (1.2) 3rd speed rpm : 300 Rack travel in mm : 7.20...7.40 Del.quantity cm3/ : 5.2...6.0 * 100 s: (-) Spread cm3 : -100 s: (-) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 300 1st speed travel mm : 1.20...1.60 rpm : 450 2nd speed : 2.90...3.50 travel mm 3rd speed rpm : 750 travel mm : 5.60...6.00 4th speed rpm : 1150 : 9.50...9.70 travel mm rpm : 1400 5th speed : 13.00...14.00 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1270 Rack travel in mm : 11.40...14.00 Speed 1/min : 220 (240) FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 1150 1st version Aneroid pressure h: 1300 Aneroid pressure h: -: 304.0...306.0 1000 : (301.0...309.0) vel.quantity Speed rpm : 500 Del.quantity cm3/ : 149.0...151.0 cm3 : 5.00Spread 1000 s: (146.0...154.0) 1000 : (9.60) Spread cm3 : 8.001000 s: (12.0) RATED SPEED 1st version **BREAKAWAY** Control lever position degrees: 118...126 1st version 1mm rack travel less than Testina: 1st rack travel in: 12.70 full load rack tr: 12.70 rpm : 1190...1200 Speed Speed rpm : 1190...1200 2nd rack travel in: 4.00 rpm : 1290...1320 Speed STARTING FUEL DELIVERY 4th rack travel in: 1400 rom : 0.00...1.00Speed Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 * LOW IDLE 1 Control Lever position degrees: 79...87 Speed Testing: Speed : 100 rpm Minimum rack trave: 8.90 : 300 rom Rack travel in mm : 7.30...7.50 HIGH IDLE Rack travel in mm: 2.00 Speed rpm : 470...530 1st version Aneroid/Altitude Compensator Test 1st version Setting 2nd version Speed : 500 rom Pressure hPa : 1300 Rack travel mm : 13.70...13.80 Measurement 1/min: 500 Speed 3rd version 1st pressure hPa : -Rack travel in m: 9.10...9.30 2nd pressure hPa : 100 Rack travel in m: 9.40...9.50 3rd pressure hPa : 470 Rack travel in m: 12.20...12.60 LOW IDLE START CUT-OUT

1000 s: (-) rpm : 100 Del.quantity cm3/: - ** 1000 s: (-) Rack travel in mm : 17.5...21.0 Aneroid pressure h: rpm : 500 Rack travel in mm : < 7.00 Del.quantity cm3/: - ** 1000 s: (-) Aneroid pressure h: -Speed rpm : 500 Rack travel in mm : < 7.50 Del.quantity cm3/ : < 50.0 1000 s: (-) Aneroid pressure h: rpm : 500 Rack travel in mm : 8.40...8.60 Del.quantity cm3/: 125.0...200.0 1000 s: (-)

Speed rpm : 300 Rack travel in mm : 7.20...7.40 Del.quantity cm3/: 52.0...60.0 * 1000 s: (-)

Remarks:

: MAN-NR. 3-7153

* applies to cylinders 4, 5, 6, 8,10 and 12 ** applies for cylinders 1, 2, 3, 7, 9 and 11

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 21,0 e2 : 18.12.92 Edition Replaces : 03.91 Test oil : ISO-4113 Combination no. : 0 402 640 833 Injection pump Pump designation : PE12P12OA52OLS7829-1 EP type number : 0 412 620 827 Governor Governor design. : RQV300...1150PA943-1 : 0 421 813 869 Governer no. Customer-spec. information Customer : MAN Engine : D2842LZE 1st version kw : 809.0 : 2300 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 **B03**

: 4.50...4.60 Prestroke mm : (4.45...4.65) Rack travel in mm : 9.00...12.00 Firing order : 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 Phasing : 0-45-60-105-120-165-180-225-240-285-300-Phasing : 345 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 12 BASIC SETTING 1st speed rpm: 1150 Rack travel in mm : 14.90...15.00 Del.quantity cm3/: 33.7...33.9 100 s: (33.4...34.2) Spread cm3 : 0.5100 s: (0.9) rpm : 500 2nd speed Rack travel in mm: 9.0...9.2 Del.quantity cm3/: 14.9...15.1 100 s: (14.6...15.4) cm3 : 8.0 Spread 100 s: (1.2)

3rd speed rpm : 300

Rack travel in mm : 7.30...7.50 Del.quantity cm3/ : 5.2...6.0 * 100 s: (-) Spread cm3 : -100 s: (-) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 300 : 1.20...1.60 travel mm rpm : 450 2nd speed : 2.90...3.50 travel mm rpm : 7503rd speed : 5.70...6.10 travel mm rpm : 1150 4th speed travel mm : 9.50...9.70 rpm : 1400 5th speed : 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position Degree: -1

rpm : 1260 Speed START CUT-OUT Rack travel in mm : 12.60...15.20 Speed 1/min: 240 (260) FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1150 Speed Aneroid pressure h: 1300 1st version Del.quantity : 337.0...342.0) Aneroid pressure h: -Speed rpm : 500
Del.quantity cm3/: 149.0...151.0
1000 s: (146.0...154.0) 1000 : (9.00) Spread cm3 : 8.00 RATED SPEED 1000 s: (12.0) 1st version Control lever **BREAKANAY** position degrees: 120...128 1st version Testina: 1mm rack travel less than 1st rack travel in: 13.90 rpm : 1190...1200 Speed full load rack tr: 13.90 2nd rack travel in: 4.00 rpm : 1190...1200 Speed rpm: 1300...1330 4th rack travel in: 1400 STARTING FUEL DELIVERY Speed rpm : 0.00...1.00 LOW IDLE 1 Speed rpm : 100 Del.quantity cm3/ : 100.0...120.0 * Control lever position degrees: 82...90 1000 s: (-) Speed rpm : 100 Del.quantity cm3/: - ** Testing: Speed rpm : 100 Minimum rack trave: 8.90 1000 s: (-) : 300 Rack travel in mm : 17.5...21.0 rpm Rack travel in mm : 7.30...7.50 HIGH IDLE CONSTANT REGULATION Speed rpm : 280...410 1st version Aneroid pressure h: -Speed rpm : 500 Rack travel in mm : < 7.00 Aneroid/Altitude Compensator Test Del.quantity cm3/: - ** 1000 s: (-) 1st version Setting 2nd version Speed : 500 Aneroid pressure h: rpm hPa : 1300 Pressure Speed rpm : 500 Rack travel mm : 14.90...15.00 Rack travel in mm : < 7.50Del.quantity cm3/ : < 50.0 1000 s: (-) Measurement 1/min: 500 Speed 3rd version 1st pressure hPa : -Aneroid pressure h: rpm : 500 Rack travel in m: 9.00...9.20 Speed 2nd pressure hPa : 100
Rack travel in m: 9.50...9.60
3rd pressure hPa : 470 Rack travel in mm : 8.50...8.70 Del.quantity cm3/: 125.0... 1000 s: (-) Rack travel in m: 12.40...12.80

LOW IDLE

Speed rpm : 300 Rack travel in mm : 7.30...7.50 Del.quantity cm3/ : 52.0...60.0 * 1000 s: (-)

Remarks:

: MAN-NR. 3-7156

 \star applies to cylinders 4, 5, 6, 8 ,10 and 12

** applies for cylinders 1, 2, 3, 7, 9 and 11

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS : 4.50...4.60 Prestroke mm Note remarks : (4.45...4.65) Rack travel in mm : 9.00...12.00 Test sheet : MAN Firing order : 18.12.92 Edition Replaces : 07.92 Test oil : ISO-4113 Combination no. : 0 402 640 838 Phasing Phasing Injection pump Pump designation : PE12P120A520LS7829-1 Tolerance + - ° : 0 412 620 827 EP type number Governor Governor design. : RQV300...1150PA1039-BASIC SETTING 1K : 0 421 815 315 Governer no. 1st speed Customer-spec. information Customer : MAN : D2842LE401 Engine 1st version kW : 735.0 : 2300 Rated speed Spread TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 2nd speed Overflow valve : 1 417 413 025 Spread cm3 Inlet press., bar: 1.50 3rd speed Test nozzle holder : 1 688 901 019 assembly Opening Spread cm3 : 207...210 pressure, bar Orifice plate diameter mm : 0,8 with governor GUIDE SLEEVE TRAVEL Test lines : 1 680 750 075 1st speed travel mm Outside diameter 2nd speed rpm x Wall thickness travel mm x Length mm : 8.00x2.50x1000 3rd speed rpm travel mm (A) Injection pump setting values 4th speed rpm Insp. values in parentheses travel mm Set equal delivery quant. 5th speed rom per values travel mm

: 12- 1- 5- 9- 8- 3-4- 11- 10- 2- 6- 7 : 0-45-60-105-120-165-: 180-225-240-285-300-345 : 0.50 (0.75) Time to cyl. no. : 12 rpm: 1150Rack travel in mm : 13.80...13.90 Del.quantity cm3/: 30.4...30.6 100 s: (30.1...30.9) cm3 : 0.5100 s: (0.9) rpm : 500 Rack travel in mm : 9.9...10.1 Del.quantity cm3/: 16.9...17.1 100 s: (16.6...17.4) 100 s: (-) rpm : 300 Rack travel in mm : 6.70...6.90 Del.quantity cm3/ : 4.0...5.0 * 100 s: (-) 100 s: (-) (B) Setting of injection pump rpm : 300 : 2.00...2.20 : 450 : 4.00...4.40 : 800 : 6.70...7.10 : 1200 : 10.30...10.50 : 1400 : 13.00...14.00 GUIDE SLEEVE POSITION Control-lever position

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Degree: -1 rpm : 1280 Speed Measurement Rack travel in mm : 10.80...14.80 1/min: 1150 Speed FULL LOAD DELIV. AT FULL LOAD STOP 1st pressure hPa : -Rack travel in m: 9.90...10.10 2nd pressure hPa : 400 1st version Rack travel in m: 10.30...10.40 3rd pressure hPa : 850 Speed rpm : 1150 Aneroid pressure h: 1300 : 304.0...306.0 1000 : (301.0...309.0) cm3 : 5.00 Del.quantity Rack travel in m: 12.40...12.70 Spread START CUT-OUT 1000 : (9.00) 1/min : 240 (260) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 116...124 1st version Aneroid pressure h: 1300 Speed rpm : 700 Del.quantity cm3/ : 254.0...260.0 1000 s: (251.0...263.0) Testing: 1st rack travel in: 12.80 Speed rpm : 1195...1210 2nd rack travel in: 4.00 cm3 : 10.00Spread rpm : 1310...1340 1000 s: (14.0) Speed 4th rack travel in: 1450 Aneroid pressure h: 1300 rpm : 0.00...1.00Speed : 900 rpm Del.quantity cm3/: 274.0.. 280.0 LOW IDLE 1 1000 s: (271.0...283.0) Control lever Aneroid pressure h: position degrees: 70...78 Speed rpm : 500 Del.quantity cm3/: 169.0...171.0 Testing: 1000 s: (166.0...174.0) Speed rpm : 200 Minimum rack trave: 8.30 Speed rpm : 300 **BREAKAWAY** Rack travel in mm : 6.70...6.90 1st version CONSTANT REGULATION 1mm rack travel less than rpm : 270...390 Speed full load rack tr: 12.80 TORQUE CONTROL rpm : 1195...1210 Speed Dimension a mm :? Torque control curve - 1st version STARTING FUEL DELIVERY 1st speed rpm : 1150
Rack travel in m: 13.80...13.90
2nd speed rpm : 700 rpm : 100 Speed Rack travel in m: 12.50...12.70 Del.quantity cm3/: 100.0...120.0 * 3rd speed rpm : 900 1000 s: (-) Rack travel in m: 13.30...13.50 Speed rpm : 100 Aneroid/Altitude Del.quantity cm3/: - ** Compensator Test 1000 s: (-) Rack travel in mm : 18.2...21.0 1st version HIGH IDLE Setting Speed : 1150 ma:n 1st version Pressure hPa : 1300 Speed rpm : 500 Rack travel mm : 13.80...13.90 Rack travel in mm : 0.00...7.00

B07

Del.quantity cm3/: - ** 1000 s: (-)

2nd version

Speed rpm : 500 Rack travel in mm : 0.00...7.50 Del.quantity cm3/: 0...50.0 1000 s: (-)

3rd version

Speed rpm : 500 Rack travel in mm : 8.50...8.70 Del.quantity cm3/: 125.0... 1000 s: (-)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 6.70...6.90
Del.quantity cm3/ : 40.0...50.0 *
1000 s: (-)

Remarks:

: MAN-NR. 3-7226

* applies to cylinders 4, 5, 6, 8, 10 and 12 ** applies for cylinders 1, 2, 3, 7, 9 and 11

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAN Test sheet 18.12.92 Edition : 07.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 640 839 Injection pump Pump designation : PE12P12OA52OLS7829-1 EP type number : 0 412 620 827 Governor Governor design. : RQV300...1150PA1039K : 0 421 315 314 Governer no. Customer-spec. information Customer : MAN Engine : D2842LE402 1st version kW : 809.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 019 Openina . pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____ BEGINNING OF DELIVERY Test pressure, bar: 25...27

: (4.45...4.65) Rack travel in mm : 9.00...12.00 : 12- 1- 5- 9- 8- 3-Firing order 4- 11- 10- 2- 6- 7 Phasing : 0-45-60-105-120-165-180-225-240-285-300-: 345 Phasing Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 12 BASIC SETTING 1st speed rpm: 1150 Rack travel in mm : 14.80...14.90 Del.quantity cm3/: 33.7...33.9 100 s: (33.4...34.2) cm3 : 0.5Spread 100 s: (0.9) rpm : 500 2nd speed Rack travel in mm : 9.9...10.1 Del.quantity cm3/: 16.9...17.1 100 s: (16.6...17.4) Spread cm3 : 0.8100 s: (1.2) rpm : 300 3rd speed Rack travel in mm : 6.70...6.90 Del.quantity cm3/: 4.0...5.0 * 100 s: (-) Spread cm3 : -100 s: (-) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 300 : 2.00...2.20 travel mm 2nd speed rpm : 450travel mm : 4.00...4.40 3rd speed rpm : 800 travel mm : 6.70...7.10 4th speed rpm : 1200travel mm : 10.30...10.50 5th speed : 1400 rpm : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position

Degree: -1

: 4.50...4.60

Prestroke mm

Speed rpm : 1265 Rack travel in mm : 11.70...15.70 Measurement Speed 1/min: 1150 FULL LOAD DELIV. AT FULL LOAD STOP 1st pressure hPa : -Rack travel in m: 9.90...10.10 1st version 2nd pressure hPa : 400 Rack travel in m: 10.30...10.40 3rd pressure hPa : 850 Speed rpm : 1150 Aneroid pressure h: 1300 : 337.0...339.0 1000 : (334.0...342.0) Rack travel in m: 12.40...12.70 Del.quantity cm3 : 5.00 1000 : (9.00) Spread START CUT-OUT Speed 1/min: 240 (260) RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 116...124 1st version Aneroid pressure h: 1300 Testing: rpm : 700 1st rack travel in: 13.80 Del.quantity cm3/: 287.0...293.0 Speed rpm : 1195...1210 1000 s: (284.0...296.0) 2nd rack travel in: 4.00 cm3 : 10.00Spread rpm : 1330...1360 Speed 1000 s: (14.0) 4th rack travel in: 1450 Aneroid pressure h: 1300 Speed rpm : 900 Del.quantity cm3/ : 307.0...313.0 1000 s: (304.0...316.0) rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever Aneroid pressure h: rpm : 500 position degrees: 71...79 Speed Del.quantity cm3/: 169.0...171.0 Testing: 1000 s: (166.0...174.0) rpm : 200 Speed Spread cm3 : 8.00 Minimum rack trave: 8.30 1000 s: (12.0) rpm : 300 Rack travel in mm : 6.70...6.90 **BREAKAWAY** CONSTANT REGULATION Speed rpm : 270...390 1st version 1mm rack travel less than TORQUE CONTROL Dimension a mm :? full load rack tr: 13.80 Torque control curve - 1st version Speed rpm : 1195...1210 1st speed rpm : 1150 Rack travel in m: 14.80...14.90 2nd speed rpm : 700 STARTING FUEL DELIVERY Rack travel in m: 13.50...13.70 3rd speed rpm : 900 rpm : 100 Del.quantity cm3/: 100.0...120.0 * 1000 s: (-) Rack travel in m: 14.30...14.50 Aneroid/Altitude Speed rpm : 100 Del.quantity cm3/: - ** 1000 s: (-) Compensator Test 1st version Rack travel in mm : 18.2...21.0 Setting : 1150 Speed rpm HIGH IDLE hPa : 1300 Pressure Rack travel mm : 14.80...14.90 1st version Speed rom : 500

Rack travel in mm : 0.00...7.00

Del.quantity cm3/: - **

1000 s: (-)

2nd version

Speed rpm : 500

Rack travel in mm : 0.00...7.50 Del.quantity cm3/: 0.0...50.0 1000 s: (-)

3rd version

Speed rpm : 500

Rack travel in mm : 8.50...8.70

Del.quantity cm3/: 125.0... 1000 s: (-)

LOW IDLE

Speed rpm : 300 Rack travel in mm : 6.70...6.90

Del.quantity cm3/: 40.0...50.0 *

1000 s: (-)

Remarks:

: MAN-NR. 3-7227

* applies to cylinders 4, 5, 6, 8, 10

and 12

** applies for cylinders 1, 2, 3, 7, 9

and 11

APPLICATION

Ship

Note remarks

Test sheet : UNI

: 18.12.92 Edition Replaces : 10.92

Test oil : ISO-4113

Combination no. : 0 402 646 607

Injection pump

Pump designation : PE6P130A720RS7270

EP type number : 0 412 636 821

Governor

Governor design. : RQV300...950PA946-4

: 0 421 814 026 Governer no.

Customer-spec. information

Customer : IVECO-UNIC

: 8210.42P.032 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm 3.0:

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 13.50...14.50

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - \circ : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 950

Rack travel in mm : 11.30...11.40

Del.quantity cm3/: 21.1...21.3

100 s: (20.8...21.6)

Spread cm3 : 0.5

100 s: (0.8)

rpm : 275.0 2nd speed Rack travel in mm: 4.5...4.9

Del.quantity cm3/: 1.9...2.5

100 s: (1.6...2.3)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed

: 8.40...8.60 travel mm

2nd speed rpm : 300

: 1.10...1.30 travel mm

rpm : 450 3rd speed

: 2.80...3.40 travel mm

4th speed rpm : 650

travel mm : 4.40...5.00

rpm : 1200 5th speed

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1060

Rack travel in mm : 9.00...11.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950

Aneroid pressure h: 1000

Del.quantity : 211.0...216.0)

: 5.00 Spread cm3 10000 : (8.00)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 10.30 rpm : 990...1000 Speed 2nd rack travel in: 4.00

rpm : 1045...1075

3rd rack travel in: 4.00 4th rack travel in: 1200

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 73...81

Testing:

Speed : 100 rpm Minimum rack trave: 6.90 : 275 rpm

Rack travel in mm : 4.60...4.80

CONSTANT REGULATION

rpm : 275...400 Speed 2

Aneroid/Altitude Compensator Test

1st version Setting

Speed rpm : 500 Pressure hPa : 1000

Rack travel mm : 11.30...11.40

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.30...10.50

2nd pressure hPa : 300

Rack travel in m: 11.00...11.10

3rd pressure hPa : 260

Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 rpm : 550 Speed

Del.quantity cm3/ : 213.0...219.0

1000 s: (210.0...222.0)

Aneroid pressure h: -

Speed rpm : 550

Del.quantity cm3/: 184.0...186.0

1000 s: (181.0...189.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.30

rpm : 990...1000

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 135.0...165.0

1000 s: (131.0...169.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.50...4.90 Del.quantity cm3/: 19.0...25.0 1000 s: (16.0...28.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : PEN Edition : 21.01.93 Replaces Test oil : ISO-4113 Combination no. : 0 402 646 610 Injection pump Pump designation : PE6P130A720RS7273 EP type number : 0 412 636 823 Governor Governor design. : RQV250...900PA881-2 Governer no. : 0 421 814 035 Customer-spec. information Customer : PENTA Engine : TAD 1630 P TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 105 Opening. : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

> : 4.50...4.60 : (4.45...4.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance $+ - ^{\circ} : 0.30 (0.75)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 700Rack travel in mm : 12.40...12.50 Del.quantity cm3/: 38.3...38.6 100 s: (38.0...39.0) Spread cm3 : 0.7100 s: (1.1) rpm : 250.02nd speed Rack travel in mm: 4.3...4.5 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) Spread cm3 : 0.7100 s: (1.1) (8) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 : 0.90...1.30 travel mm rpm : 3502nd speed 2.00...2.60 travel mm rpm : 700 3rd speed : 4.50...5.10 travel mm rpm : 925 4th speed : 7.60...7.80 travel mm rpm : 985 5th speed : 8.40...8.80 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 980 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 Aneroid pressure h: 1600 Del.quantity : 303.3...300.0)

Prestroke mm

Spread

: 7.00 cm3

 $10000 \div (11.00)$

RATED SPEED

1st version

Control lever

position degrees: 117...125

Testina:

1st rack travel in: 11.40

rpm : 960...970 Speed

2nd rack travel in: 4.00

rpm : 1025...1055 Speed

4th rack travel in: 1180

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 64...72

Testing:

Speed rpm : 100

Minimum rack trave: 6.00

Speed rpm : 250

Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

rpm : 250...420 Speed

Aneroid/Altitude

Compensator Test

1st version

Setting

: 500 Speed mor:

hPa : 1600 Pressure

Rack travel mm : 12.40...12.50

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 8.90...9.10

2nd pressure hPa : 500

Rack travel in m: 9.10...9.20

3rd pressure hPa : 980

Rack travel in m: 11.90...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 700 Speed

Del.quantity cm3/: 249.5...252.5

1000 s: (246.0...256.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40

rpm : 960...970 Speed

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.30...4.50

Del.quantity cm3/: 17.0...23.0 1000 s: (14.0...26.0) Spread cm3: 7.00

1000 s: (11.00)

Remarks:

Note remarks

Test sheet : PEN

Edition : 03.02.93

Replaces :

Test oil : ISO-4113

Combination no. : 0 402 646 617

Injection pump

Pump designation : PE6P130A320R\$7282

EP type number : 0 412 636 825

Governor

Governor design. : RQV300...900PA1059

Governer no. : 0 421 814 049

Customer-spec. information Customer : PENTA

Engine : TAD 1230 P

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter y Wall thickness

 \times Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10

: (3.95...4.15)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.30 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 11.00...11.10

Del.quantity cm3/: 32.1...32.4

100 s: (31.8...32.8)

Spread cm3 : 0.7

100 s: (1.1)

2nd speed rpm : 300.0 Rack travel in mm : 4.4...4.6

Del.quantity cm3/: 2.0...2.5 100 s: (1.8...2.8)

Spread cm3 : 0.7

100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.50...1.90

2nd speed rpm : 450

travel mm : 3.20...3.80

3rd speed rpm : 700

travel mm : 5.20...5.80

4th speed rpm: 915

travel mm : 7.50...7.70

5th speed rpm: 1000

travel mm : 8.40...8.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm: 980

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700 Aneroid pressure h: 1800

Del.quantity : 321.5...324.5

1000 : (318.0...328.0)

Spread

cm3 : 7.00

1000 : (11.00)

RATED SPEED

1st version

Control lever

position degrees: 113...121

Testing:

1st rack travel in: 10.00

rpm : 910...920 Speed

2nd rack travel in: 4.00

rpm : 985...1015 Speed

4th rack travel in: 1100

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 67...75

Testing:

Speed : 100 rpm

Minimum rack trave: 6.10

: 300 Speed rom

Rack travel in mm : 4.40...4.60

CONSTANT REGULATION

Speed rpm : 300...430

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 500 rpm

Pressure hPa : 1800

Rack travel mm : 11.00...11.10

Measurement

Speed $1/\min : 500$

1st pressure hPa : -

Rack travel in m: 8.00...8.20

2nd pressure hPa : 1100

Rack travel in m: 10.70...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700
Del.quantity cm3/ : 210.5...213.5

1000 s: (207.0...217.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.00

rpm : 910...920 Speed

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.40...4.60

Del.quantity cm3/: 20.5...25.5 1000 s: (18.0...28.0)

Spread cm3 : 7.00

1000 s: (11.00)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 11.01.93 Edition Replaces : ISO-4113 Test oil Combination no. : 0 402 646 787 Injection pump Pump designation : PE6P120A32CLS7858 EP type number : 0 412 626 875 Governor Governor design. : RQ300/1050PA1031-12 : 0 421 801 631 Governer no. Customer-spec. information : MERCEDES-BENZ Customer Engine : 0M401 LA 1st version kw : 180.0 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h; 100...120 Test nozzle holder : 1 688 901 105 assembly Opening : 207...210 pressure, bar Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____

BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 5.50...5.60 Prestroke mm : (5,45...5.65) Rack travel in mm : 20.00...21.00 : 6- 3- 5- 2- 4-Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75)Time to cyl. no. : 6 BASIC SETTING 1st speed rpm : 1050Rack travel in mm : 11.10...11.20 Del.quantity cm3/: 17.0...17.2 100 s: (16.7...17.5) cm3 : 0.5Spread 100 s: (0.9) rpm : 300.02nd speed Rack travel in mm: 4.9...5.5 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.6Spread 100 s: (1.0) GUIDE SLEEVE POSITION

Control-lever position Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 1050Aneroid pressure h: 700

: 170.0...172.0 Del.quantity 1000 : (167.0...175.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0

Testing: 1st rack travel in: 10.10 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring : 300 Rack travel in mm: 5.2 Testing: Speed : 200 rpm Minimum rack trave: 7.60 Speed rpm : 300
Rack travel in mm : 5.10...5.30
Rack travel in mm : 2.00 Speed rpm : 360...400 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : -Rack travel mm : 9.90...10.20 Measurement Speed 1/min : 500 1st pressure hPa : 200 Rack travel in m: 10.10...10.20 2nd pressure hPa : 300 Rack travel in m: 10.60...10.80 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 700 Speed rpm : 550 Del.quantity cm3/ : 160.0...164.0 1000 s: (157.0...167.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -: 500 rpm Del.quantity cm3/: 130.0...132.0 1000 s: (127.0...135.0)

cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1090...1105

Remarks:

Spread

Note remarks

Test sheet

Edition

: 11.01.93

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 646 788

Injection pump

Pump designation : PE6P120A320LS7858

EP type number

: 0 412 626 875

Governor

Governor design. : RQ300/1050PA1031-11

Governer no.

: 0 421 801 680

Customer-spec. information : MERCEDES-BENZ

Customer

Engine

: 0M4.01 I A

1st version kW

: 200.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

8,0:

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 6

BASIC SEITING

1st speed

rpm : 1050

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 18.9...19.1

100 s: (18.6₄...19.4)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050Aneroid pressure h: 800

Aneroju p. ... Del.quantity 1000

: 189.0...191.0

: (186.0...194.0) : 5.00

cm3

1000 : (9.00)

RATED SPEED

Spread

1st version

Setting point:

Speed rpm

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.70

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

Speed rpm : 1160...1190

4th rack travel in: 1300

rpm : 0.00...1.50Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 5.2

Testing:

Speed : 200 rpm Minimum rack trave: 8.00 : 300 Speed rpm

Rack travel in mm : 5.10...5.30

Rack travel in mm: 2.00

Speed : 360...400 rom

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 Pressure hPa : -

Rack travel mm : 9.60...9.90

Measurement

Speed $1/\min : 500$

1st pressure hPa : 200

Rack travel in m: 10.00...10.10 2nd pressure hPa : 350 Rack travel in m: 10.70...10.90

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800 Speed rpm : 550 Del.quantity cm3/ : 182.0...186.0

1000 s: (179.0...189.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

: 500 Speed rpm

Del.quantity cm3/: 126.0...128.0

1000 s: (123.0...131.0)

cm3 : 8.00Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70

Speed rpm : 1090...1105

Remarks:

Note remarks

Test sheet

Edition

: 11.C1.93

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 646 789

Injection pump

Pump designation : PE6P120A320LS7846

EP type number

: 0 412 626 865

Governor

Governor design. : RQ300/1050PA1031-10

Governer no.

: 0 421 801 679

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA

1st version kW

: 213.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening |

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 6

BASIC SETTING

1st speed

rom : 1050

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 20.1...20.3

100 s: (19.8...20.6)

Spread

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1050

Ameroid pressure h: 800

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread

: 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

: 600

rpm

Rack travel in mm: 20.0

Testing:

1st rack travel in: 11.40

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

Speed rpm : 1165...1195 4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

nom : 300 Rack travel in mm: 5.7

Testing:

Speed rpm : 200 Minimum rack trave: 8.00

npm : 300 Speed

Rack travel in mm : 5.60...5.80

Rack travel in mm : 2.00

Speed rpm : 360...400

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rom : 500

hPa : -Pressure

Rack travel mm : 9.90...10.20

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : 200

Rack travel in m: 10.30...10.40

2nd pressure hPa : 450

Rack travel in m: 11.60...11.80

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800

Speed rpm : 550 Del.quantity cm3/ : 195.0...199.0

1000 s: (192.0...202.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

rpm : 500

Del.quantity cm3/: 126.0...128.0

1000 s: (123.0...131.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40

rpm : 1090...1105 Speed

Remarks:

823

Note remarks

Test sheet

: MB

Edition

: 05.02.93

Replaces

Test oil

: ISO-4113

Combination no.

: 0 402 646 790

Injection pump

Pump designation: PE6P120A320LS7864

EP type number

: 0 412 626 879

Governor

Governor design. : RQV350...1050PA1052

Governer no.

: 0 421 814 044

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M401 LA, Euro 1

1st version kW

: 213.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test Lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm : 550

Rack travel in mm : 12.40...12.50

Del.quantity cm3/: 20.0...20.2

100 s: (19.7...20.5)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 350.0

Rack travel in mm: 4.9...5.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVE!

1st speed

rpm : 350

: 1.00...1.50

travel mm 2nd speed

travel mm

rpm : 453

3rd speed

: 2.30...2.80 : 770

travel mm

rpm : 4.70...5.20

4th speed

rpm : 1108

travel mm

: 9.40...9.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190

Rack travel in mm : 10.10...12.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Speed

rpm : 550

Aneroid pressure h: 1000

Del.quantity : 200.3...202.0 1000 : (197.0...205.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 99...107 Testing: 1st rack travel in: 11.40 Speed rpm : 1090...1100 2nd rack travel in: 4.00 rpm : 1145...1175 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.00 LOW IDLE 1 Control Lever position degrees: 65...73 Testing: Speed man : 250 Minimum rack trave: 8.70 : 350 Speed rpm Rack travel in mm : 5.10...5.30 Rack travel in mm: 2.00 Speed rpm : 420...460 CONSTANT REGULATION rpm : 380...450 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : -: 10.00...10.30 Rack travel mm Measurement Speed 1/min : 500 1st pressure hPa : 200 Rack travel in m: 10.40...10.50 2nd pressure hPa : 450 Rack travel in m: 11.70...11.90

START CUT-OUT Speed 1/min : 270 (290) FUEL DELIVERY CHARACTERISTICS 1st version **B25**

Aneroid pressure h: 1000 : 1050 Speed rpm Del.quantity cm3/: 200.0...204.0 1000 s: (197.0...207.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1000 Speed : 1050 rpm Del.quantity cm3/: 150.0...154.0 * 1000 s: (147.0...157.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 126.0...128.0 1000 s: (123.0...131.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.40 Speed rpm : 1090...1100 STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 170.0...190.0 1000 s: (166.0...194.0)

Remarks:

* = Set at reduced-delivery stop.

Note remarks

Test sheet : MB

Edition : 18.12.92 : 10.92 Replaces Test oil : ISO-4113

Combination no. : 0 402 646 793

Injection pump

Pump designation : PE6P120A320LS7846 EP type number : 0 412 626 865

Governor

Governor design. : RQ300/1050PA1030-8

Governer no. : 0 421 801 673

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA

1st version kW : 213.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.20...5.30 Prestroke mm

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.30...12.40

Del.guantity cm3/: 20.1...20.3

100 s: (19.8...20.6)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm: 5.3...5.9 Del.guantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050Aneroid pressure h: 800

Del.quantity : 201.0...206.0)

cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version

Setting point:

Speed : 600 rpm Rack travel in mm: 20.0

Testing: 1st rack travel in: 11.40 Speed rpm : 1090...1105 2nd rack travel in: 4.00 Speed rpm : 1165...1195 4th rack travel in: 1300 rpm : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.7 Testing: Speed rpm : 200 Minimum rack trave: 8.00 Speed rpm : 300 Rack travel in mm : 5.60...5.80 Rack travel in mm : 2.00 rpm : 360...400 Speed Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 hPa : -Pressure Rack travei mm : 9.90...10.20 Measurement Speed $1/\min : 500$ 1st pressure hPa : 200 Rack travel in m: 10.30...10.40 2nd pressure hPa : 450 Rack travel in m: 11.60...11.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 800 Speed : 550 rpm Del. quantity cm3/: 195.0...199.0 1000 s: (192.0...202.0) cm3 : 8.00 1000 s: (12.0) Spread Aneroid pressure h: -: 500 Speed rpm Del. quantity cm3/: 126.0...128.0

1000 s: (123.0...131.0)

cm3 : 8.00 1000 s: (12.0) 1st version 1mm rack travel less than

full load rack tr: 11.40 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 40.0...70.0

1000 s: (36.0...74.0) Rack travel in mm : 9.90...10.30

Remarks:

BREAKAWAY

Spread

BOSCH INJ. PUMP TEST SPECIFICATIONS : 5.20...5.30 Prestroke mm : (5.15...5.35) Note remarks Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order : DAF 11,7 j Test sheet : 21.01.93 Edition Replaces : 02.91 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 893 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PE6P120A320RS7202 EP type number : 0 412 626 835 BASIC SETTING Governor Governor design. : RQ250/1000PA936 1st speed rpm: 850 : 0 421 801 507 Governer no. Rack travel in mm : 11.90...12.00 Customer-spec. information Customer : DAF Del.quantity cm3/: 21.7...21.9 Engine : WS 268 100 s: (21.4...22.2) 1st version kW : 268.0 cm3 : 0.5Spread Rated speed : 2000 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 250.0 2nd speed Test oil Rack travel in mm: 4.9...5.3 inlet temp. °C : 38...42 Del.quantity cm3/: 2.3...2.9 100 s: (2.0...3.2) Overflow valve Spread cm3 : 0.8: 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -1 assembly : 1 688 901 019 rpm : 550 Speed Rack travel in mm : 15.20...16.40 Openina (: 207...210 pressure, bar FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 Speed rpm : 850 Aneroid pressure h: 1000 : 217.0...219.0 Del.quantity : 1 680 750 075 Test Lines 1000 : (214.0...222.0) Spread cm3 : 5.00 Outside diameter 1000 : (9.00) x Wall thickness x Lenath mm : 8.00x2.50x1000 RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: per values ____ Speed rpm Rack travel in mm : 15.8 BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testina:

1st rack travel in: 10.90

rpm : 1035...1050 Speed

2nd rack travel in: 4.00

rpm : 1130...1160 Speed

4th rack travel in: 1250

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm: 5.1

Testina:

Speed rpm : 100 Minimum rack trave: 6.60 rpm : 250

Rack travel in mm : 5.00...5.20 Rack travel in mm : 2.00

rpm : 310...350 Speed

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 12.90...13.00

2nd speed rpm : 1000

Rack travel in m: 12.80...13.00

Aneroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm hPa : 1000 Pressure

: 11.90...12.00 Rack travel mm

Measurement

Speed 1/min: 600

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 320

Rack travel in m: 11.10...11.20

3rd pressure hPa : 190

Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 600 Speed

Del.quantity cm3/: 153.0...155.0

1000 s: (150.0...158.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90

rpm : 1035...1050 Speed

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 23.0...29.0 1000 s: (20.0...32.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

CO1

BOSCH INJ. PUMP TEST SPECIFICATIONS : 5.20...5.30 Prestroke mm : (5.15...5.35) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Test sheet : DAF 11,7 k6 Edition : 21.01.93 Replaces : 09.91 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 894 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PE6P12OA32ORS7194 EP type number : 0 412 626 834 BASIC SETTING Governor Governor design. : RQ250/1000PA936 rpm: 850 1st speed Governer no. : 0 421 801 507 Rack travel in mm : 13.70...13.80 Customer-spec. information Customer : DAF Del.quantity cm3/: 24.5...24.7 Engine : WS 295 100 s: (24.2...25.0) 1st version kW : 295.0 cm3 : 0.5Spread Rated speed : 2000 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0 Rack travel in mm : 7.6...8.0 Del.quantity cm3/ : 1.4...2.0 Test oil inlet temp. °C : 38...42 100 s: (1.1...2.3) Overflow valve cm3 : 0.8Spread : 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -1 assembly : 1 688 901 019 rpm : 550 Speed Rack travel in mm : 15.20...16.40 Opening pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm Speed : 0,8 rpm : 850 Aneroid pressure h: 1000 Del.quantity : 245.0...247.0 Test lines : 1 680 750 075 1000 : (242.0...250.0) : 5.00 Spread cm3 Outside diameter 1000 : (9.00) x Wall thickness x Length mm : 8.00x2.50x1000 RATED SPEED (A) Injection pump setting values 1st version Insp. values in parentheses Set equal delivery quant. Setting point: per values Speed rpm Rack travel in mm: 15.8 BEGINNING OF DELIVERY Test pressure, bar: 25...27 Testing:

1st rack travel in: 12.70

rpm : 1035...1050 Speed

2nd rack travel in: 4.00

Speed rpm : 1130...1160 4th rack travel in: 1250

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm: 7.0

Testing:

Speed rpm : 100 Minimum rack trave: 8.50 rpm : 250

Rack travel in mm : 6.90...7.10

Rack travel in mm : 2.00

Speed rpm : 345...385

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 14.70...14.80

2nd speed rpm : 1000

Rack travel in m: 14.60...14.80

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 600 rpm Pressure hPa : 1000

Rack travel mm : 13.70...13.80

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 11.00...11.20

2nd pressure hPa : 460

Rack travel in m: 13.00...13.10
3rd pressure hPa : 310
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 600

Del.quantity cm3/: 171.0...173.0 1000 s: (168.0...176.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70

rpm : 1035...1050 Speed

LOW IDLE

Speed rpm : 250

Rack travel in mm : 6.90...7.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

C03

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4 Note remarks : DAF 11,7 j3 : 18.12.92 Test sheet Edition Replaces : 09.91 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 895 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PE6P120A320RS7202 EP type number : 0 412 626 835 BASIC SETTING Governor Governor design. : RQV250...1000PA939 1st speed rpm: 850 : 0 421 813 829 Governer no. Rack travel in mm : 11.90...12.00 Customer-spec, information Customer : DAF Del.quantity cm3/: 21.7...21.9 Engine : WS 268 100 s: (21.4...22.2) 1st version kW : 268.0 Spread cm3 : 0.5Rated speed : 2000 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0Rack travel in mm: 4.9...5.3 Test oil inlet temp. °C : 38...42 Del.quantity cm3/: 2.3...2.9 100 s: (2.0...3.2) Overflow valve Spread cm3 : 0.8: 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 019 GUIDE SLEEVE TRAVEL 1st speed rpm : 250 Opening. : 0.70...1.10 travel mm pressure, bar : 207...210 rpm : 400 2nd speed : 2.50...3.10 travel mm Orifice plate : 700 3rd speed rpm diameter mm : 0,8 : 4.50...4.90 travel mm 4th speed rpm : 1045 travel mm : 7.80...8.00 Test lines : 1 680 750 075 5th speed : 1350 rpm travel mm : 11.00...12.00 Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 8.00x2.50x1000 Control-lever position Degree: -1 (A) Injection pump setting values Speed rpm : 1125 Insp. values in parentheses Rack travel in mm : 15.20...17.80 Set equal delivery quant. per values FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 Speed rpm : 850

Aneroid pressure h: 1000

: 217.0...219.0 Del.quantity

1000 : (214.0...222.0)

: 5.00 Spread cm3

1000 ; (9.00)

RATED SPEED

1st version Control lever

position degrees: 113...121

Testing:

1st rack travel in: 10.90

rpm : 1030...1040 Speed

2nd rack travel in: 4.00

Speed rpm : 1120...1150

4th rack travel in: 1300

rpm : 0.00...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 74...82

Testing:

rpm : 100 Speed Minimum rack trave: 6.60 rom : 250

Rack travel in mm : 5.00...5.20

CONSTANT REGULATION

rpm : 270...380 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 600 Pressure hPa : 1000

: 11.90...12.00 Rack travel mm

Measurement

 $1/\min:600$ Speed

1st pressure hPa : -

Rack travel in m: 9.40...9.60

2nd pressure hPa : 320

Rack travel in m: 11.10...11.20

3rd pressure hPa : 190

Rack travel in m: 10.10...10.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: rpm : 600 Speed

Del.quantity cm3/: 153.0...155.0 1000 s: (150.0...158.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90

rpm : 1030...1040 Speed

LOW IDLE

Speed : 250 rpm

Rack travel in mm : 4.90...5.30 Del.quantity cm3/ : 23.0...29.0

1000 s: (20.0...32.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS : 5.20...5.30 Prestroke mm : (5.15...5.25) Rack travel in mm : 9.00...12.00 Note remarks : 1-5-3-6-2-4 Firing order : DAF 11,7 k4 : 18.12.92 Test sheet Edition Replaces : 09.91 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 896 Tolerance $+ - ^{\circ} : 0.50 (0.75)$ Injection pump Time to cyl. no. : 1 Pump designation : PE6P120A320RS7194 EP type number : 0 412 626 834 BASIC SETTING Governor Governor design. : RQV250...1000PA939 1st speed rpm : 850: 0 421 813 829 Governer no. Rack travel in mm : 13.70...13.80 Customer-spec. information Customer : DAF Del.quantity cm3/: 24.5...24.7 Engine : WS 295 100 s: (24.2...25.0) : 295.0 ist version kW Spread cm3 : 0.5Rated speed : 2000 100 s: (0.9) TEST BENCH REQUIREMENTS rpm : 250.0 2nd speed Rack travel in mm : 7.6...8.0 Del.quantity cm3/: 1.4...2.0 Test oil inlet temp. °C : 38...42 100 s: (1.1...2.3) Overflow valve cm3 : 0.8Spread : 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder assembly : 1 688 901 019 GUIDE SLEEVE TRAVEL 1st speed rpm : 250 : 0.70...1.10 Opening. travel mm pressure, bar : 207...210 rpm : 400 2nd speed travel mm : 2.50...3.10 Orifice plate 3rd speed rpm : 700 : 4.50...4.90 diameter mm : 0,8 travel mm 4th speed rpm : 1045 travel mm : 7.80...8.00 Test lines : 1 680 750 075 5th speed rpm : 1350travel mm : 11.00...12.00 Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 8.00x2.50x1000 Control-lever position Degree: -1 Speed rpm : 1125 Rack travel in mm : 15.20...17.80 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ___ FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 245.0...247.0

1000 : (242.0...250.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 115...123

Testing:

1st rack travel in: 12.70

rpm : 1030...1040 Speed

2nd rack travel in: 4.00

rpm : 1140...1170 Speed

4th rack travel in: 1250

rpm : 0.00...1.40 Speed

LOW IDLE 1 Control lever

position degrees: 81...89

Testing:

Speed rom : 100 Minimum rack trave: 8.50 rpm : 250

Rack travel in mm : 6.90...7.10

CONSTANT REGULATION

rpm : 275...385 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 600 Speed riom Pressure hPa : 1000

Rack travel mm : 13.70...13.80

Measurement

Speed 1/min: 600

1st pressure hPa : -

Rack travel in m: 11.00...11.20

2nd pressure hPa : 460

Rack travel in m: 13.00...13.10

3rd pressure hPa : 310

Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600 Del.quantity cm3/ : 171.0...173.0 1000 s: (168.0...176.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.70

Speed rpm : 1030...1040

LOW IDLE

Speed : 250 rpm

Rack travel in mm : 6.90...7.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 5.30...5.40 : (5.25...5.45) Rack travel in mm : 14.50...15.50 Firing order : 1-5-3-6-2-4 Note remarks : DAF 11,7 L : 18.12.92 Test sheet Edition : 09.91 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 646 912 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PE6P120A320RS7218 EP type number : 0 412 626 839 BEGINNING OF DELIVERY DIFFERENCE Governor Governor design: : RQ250/1000PA936-1 betw. rack trav. m: 4.90...5.10 Governer no. : 0 421 801 508 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.25...3.75 Customer-spec, information Customer : DAF BASIC SETTING Engine : WS 268 G 1st speed rpm : 8501st version kW : 268.0 Rack travel in mm : 15.00...15.10 Rated speed : 2000 Del.quantity cm3/: 23.7...23.9 TEST BENCH REQUIREMENTS 100 s: (23.4...24.2) Test oil inlet temp. °C : 38...42 Spread cm3 : 0.5Overflow valve 100 s: (0.9) : 1 417 413 025 2nd speed rpm : 250.0Inlet press., bar : 1.50 Rack travel in mm: 6.6...7.0 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) Test nozzle holder : 1 688 901 019 assembly Spread cm3 : 0.8100 s: (1.2) Opening pressure, bar : 207...210 GUIDE SLEEVE POSITION Control-lever position Orifice plate Degree: -1 diameter mm rpm : 550 : 0,8 Rack travel in mm : 15.80...17.00 : 1 680 750 075 Test lines FULL LOAD DELIV. AT FULL LOAD STOP Outside diameter 1st version x Wall thickness Speed rpm : 850 Aneroid pressure h: 1000 : 8.00x2,50x1000 x Length mm Del.quantity : 237.0...239.0 (A) Injection pump setting values 1000 : (234.0...242.0) Insp. values in parentheses : 5.00 Spread cm3 Set equal delivery quant. 1000 : (9.00) per values RATED SPEED BEGINNING OF DELIVERY Test pressure, bar: 25...27 1st version

Setting point:

Speed rom : 550 Rack travel in mm: 16.4

Testing:

1st rack travel in: 14.00 Speed rpm : 1035...1050 2nd rack travel in: 4.00

rpm : 1140...1170

4th rack travel in: 1250

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm: 5.0

Testing:

Speed rpm : 100 Minimum rack trave: 6.50 rpm : 250

Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00

Speed rpm : 310...350

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 15.30...15.40

2nd speed rpm : 1000 Rack travel in m: 15.20...15.40

Ameroid/Altitude Compensator Test

1st version

Setting

: 600 Speed rpm Pressure

hPa : 1000 mm : 15.00...15.10 Rack travel mm

Measurement

1/min : 600 Speed

1st pressure hPa : -

Rack travel in m: 12.40...12.60

2nd pressure hPa : 480

Rack travel in m: 14.20...14.30

3rd pressure hPa : 330

Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 167.0...169.0 1000 s: (164.0...172.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

009

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : DAF 11,7 L1 Edition : 18.12.92 Replaces : 02.91 : ISO-4113 Test oil Combination no. : 0 402 646 913 Injection pump Pump designation : PE6P120A320RS7218 EP type number : 0 412 626 839 Governor Governor design. : RQV250...1000PA939 : 0 421 813 829 Governer no. Customer-spec. information Customer : DAF Engine : WS 268 G 1st version kW : 268.0 Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening. : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.30...5.40 : (5.25...5.45) Prestroke mm Rack travel in mm : 14.50...15.50 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 4.90...5.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.25...3.75 BASIC SETTING rpm:8501st speed Rack travel in mm : 15.00...15.10 Del.quantity cm3/: 23.7...23.9 100 s: (23.4...24.2) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 250.0Rack travel in mm: 6.6...7.0 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) Spread cm3 : 0.8100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1045 1st speed : 7.80...8.00 travel mm 2nd speed rpm : 250 : 0.70...1.10 travel mm 3rd speed : 400 man : 2.50...3.10 travel mm : 700 4th speed rpm : 4.50...4.90 travel mm rpm : 13505th speed travel mm : 11.00...12.00 GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1125 Rack travel in mm : 15.20...17.80` FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850 Aneroid pressure h: 1000

: 237.0...239.0 1000 : (234.0...242.0) Del.quantity

Spread : 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 118...126

Testing:

1st rack travel in: 14.00

rpm : 1040...1050 Speed

2nd rack travel in: 4.00

Speed rpm : 1160...1190 4th rack travel in: 1250

rpm : 0.00...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 78...86

Testing:

Speed rpm : 100Minimum rack trave: 6.50

Speed rpm : 250 Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 270...380 Speed

Aneroid/Altitude Compensator Test

1st version

Setting Speed rom

: 600 Pressure hPa : 1000

Rack travel mm : 15.00...15.10

Measurement

1/min: 600 Speed

1st pressure hPa : -

Rack travel in m: 12.40...12.60

2nd pressure hPa : 480

Rack travel in m: 14.20...14.30

3rd pressure hPa : 330 Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 600 Del.quantity cm3/ : 167.0...169.0

1000 s: (164.0...172.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

rpm : 1040...1050

LOW IDLE

Speed rpm : 250 Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet

: SCA

Edition

: 11.01.93

Replaces

: 10.92

Test oil

: ISO-4113

Combination no. : 0 402 646 938

Injection pump

Pump designation : PE6P12DA72ORS71880

EP type number

: 0 412 626 846

Governor

Governor design. : RQ200/950PA745-3

Governer no.

: 0 421 801 579

Customer

Customer-spec. information : SCANIA

Engine

: DSC 11 21

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 104

: 250...253

Opening

pressure, bar

Orifice plate

diameter mm

: 0,7

Test lines

: 1 680 750 008

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.40...4.50

: (4.35...4.55)

Rack travel in mm : 9.00...12.00

Phasing

: 0-60-120-180-240-300

: 1-5-3-6-2-4

Tolerance + - °

Firing order

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

Spread

rpm: 700

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 21.9...22.1

100 s: (21.6...22.4)

cm3 : 0.8

100 s: (1.2)

rpm : 250.02nd speed

Rack travel in mm: 4.6...5.0 Del.quantity cm3/: 1.5...1.9

100 s: (-)

Spread

cm3 : 0.4

100 s: (0.8)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

200 : man

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 700 Speed

Aneroid pressure h: 1500 Del.quantity : 219.0...224.0)

cm3 : 8.00 1000 : (12.00)

RATED SPEED

Spread

1st version

Setting point:

: 600 Speed rom

Rack travel in mm: 16.5

Testing:

1st rack travel in: 11.70 Speed rpm : 995...1010

2nd rack travel in: 4.00

Speed

rpm : 1085...1115

C12

4th rack travel in: 1250

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250 Rack travel in mm: 4.7

Testing:

Speed rpm : 125 Minimum rack trave: 6.20 rpm : 250

Rack travel in mm : 4.60...4.80

Rack travel in mm : 2.00

Speed rpm : 330...370

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rom hPa : 1500 Pressure

Rack travel mm : 12.70...12.80

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 10.20...10.60

2nd pressure hPa : 440

Rack travel in m: 12.00...12.10 3rd pressure hPa : 270

Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500 rpm : 950 Speed

Del.quantity cm3/: 202.0...210.0 1000 s: (200.0...212.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 151.0...155.0 1000 s: (149.0...157.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 995...1010 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 160.0...200.0 1000 s: (-) Rack travel in mm : 10.20...10.60

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO

diaphragm.

APPLICATION

Omnibus

Note remarks

Test sheet : MB 11,1 b 2 : 03.02.93 Edition Replaces : 11.91

Test oil : ISO-4113

Combination no. : 0 402 646 956

Injection pump

Pump designation * PE6P120A320LS7837-1

EP type number : 0 412 626 858

Governor

Governor design. : RQV350...1050PA842-9

: 0 421 813 955 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M441 LA

1st version kW : 250.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm 3,0:

Test Lines : 1 680 750 067

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.05)

Rack travel in mm : 20.00...21.00 Firing order : 6-3-5-2-4-1

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.50...14.70

Del.quantity cm3/: 23.4...23.6

100 s: (23.1...23.9)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6 Spread 100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

travel mm : 0.70...1.30

2nd speed rpm : 470

: 2.60...3.10 travel mm

3rd speed rpm : 940

: 5.20...5.70 travel mm

rpm : 1106 4th speed

: 6.70...7.20 travel mm

5th speed rpm : 1263

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1185 Speed

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 600 Aneroid pressure h: 1000 : 234.0...236.0 Del.quantity 1000 : (231.0...239.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 111...119 Testing: 1st rack travel in: 13.50 rpm : 1090...1100 2nd rack travel in: 4.00 rpm : 1180...1210 Speed 4th rack travel in: 1300 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 63...71 Testing: Speed : 200 rom Minimum rack trave: 7.30 rpm : 350 Rack travel in mm : 5.10...5.70 CONSTANT REGULATION Speed rpm : 350...600 TORQUE CONTROL Dimension a mm : 0.60 2nd speed rpm : 1050 Rack travel in m: 14.50...14.70 rpm : 950 3rd speed Rack travel in m: 14.80...15.00 4th speed rpm : 800 Rack travel in m: 15.10...15.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 r tom Pressure hPa : 1000 Rack travel mm : 14.50...14.70 Measurement 1/min : 600 Speed 1st pressure hPa : 200 Rack travel in m: 9.60...9.80 2nd pressure hPa : 600

Rack travel in m: 13.30...13.50 3rd pressure hPa : 1250 Rack travel in m: 14.60...14.80 4th pressure hPa : -Rack travel in m: 8.90...9.20 START CUT-OUT Speed 1/min : 270 (290) FUEL DELIVERY CHARACTERISTICS 1st version Ameroid pressure h: 1800 rpm : 1050 Speed Del.quantity cm3/: 234.0...237.0 1000 s: (231.0...240.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1800 : 800 Speed rpm Del.quantity cm3/: 247.0...251.0 1000 s: (244.0...254.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm: : 500 Spead Del.quantity cm3/: 135.0...137.0 1000 s: (132.0...140.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.50 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 250.0...270.0 1900 s: (246.0...274.0) Remarks: * Increase in control-rod travel with respect to setting at least 0.1 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : DAF 11,7 13 Edition : 18,12,92 Replaces : 01.92 Test oil : ISO-4113 Combination no. : 0 402 646 963 Injection pump Pump designation : PE6P120A320RS7218Y EP type number : 0 412 626 859 Governor Governor design: : RQ250/1000PA936-1 : 0 421 801 508 Governer no. Customer-spec. information Customer : DAF Engine : WS 242 G TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening | pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.30...5.40 : (5.25...5.45)

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 1 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 4.90...5.10 & maximum rack tra: 14.5...15.5 Difference * CS : 2.25...3.75 BASIC SETTING 1st speed rpm : 850 Rack travel in mm : 14.30...14.40 Del.quantity cm3/: 21.5...21.7 100 s: (21.2...22.0) cm3 : 0.5 Spread 100 s: (0.9) rpm : 250.0 2nd speed Rack travel in mm: 6.6...7.0 Del.quantity cm3/: 1.4...2.0 100 s: (1.1...2.3) cm3 : 0.8Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 550 Speed Rack travel in mm : 15.80...17.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 850 Aneroid pressure h: 1000 Del.quantity : 215.0...217.0 1000 : (212.0...220.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Setting point: Speed rpm : 550 Rack travel in mm: 16.4

Rack travel in mm : 14.00...15.00

Testing:

1st rack travel in: 13.30

rpm : 1035...1050 Speed

2nd rack travel in: 4.00

Speed rpm : 1140...1170 4th rack travel in: 1250

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

rpm : 250 Rack travel in mm : 5.0

Testing:

Speed rpm : 100 Minimum rack trave: 6.50

Speed rpm : 250
Rack travel in mm : 4.90...5.10
Rack travel in mm : 2.00

Speed rpm : 310...350

TORQUE CONTROL

Dimension a mm :-

Torque control curve - 1st version

1st speed rpm : 850

Rack travel in m: 15.30...15.40 2nd speed rpm : 1000 Rack travel in m: 15.20...15.40

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 600Pressure hPa : 1000

Rack travel mm : 14.30...14.40

Measurement

Speed $1/\min : 600$

1st pressure hPa : -

Rack travel in m: 12.30...12.50

2nd pressure hPa : 420

Rack travel in m: 13.80...13.90

3rd pressure hPa : 310

Rack travel in m: 13.10...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

rpm : 600

Del.quantity cm3/: 167.0...169.0

1000 s: (164.0...172.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.30

rpm : 1035...1050 Speed

LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.90...5.10

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet : DAF 11,7 L4 Edition 18.12.92 : 01.92 Replaces : ISO-4113 Test oil

Combination no. : 0 402 646 964

Injection pump

Pump designation : PE6P120A320RS7218Y EP type number : 0 412 626 859

Governor

Governor design. : RQV250...1000PA939

: 0 421 813 829 Governer no.

Customer-spec. information Customer : DAF

Engine : WS 242 G

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40

: (5.25...5.45)

Rack travel in mm : 14.00...15.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10 & maximum rack tra: 14.5...15.5 Difference ° CS : 2.25...3.75

BASIC SETTING

rpm: 850 1st speed

Rack travel in mm : 14.30...14.40

Del.quantity cm3/: 21.5...21.7

100 s: (21.2...22.0)

cm3 : 0.5Spread

100 s; (0.9)

rpm : 250.0 2nd speed Rack travel in mm: 6.6...7.0 Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1045 1st speed

: 7.80...8.00 travel mm

2nd speed rpm : 250

travel mm : 0.70...1.10

3rd speed rpm : 400

: 2.50...3.10 travel mm

rpm : 700 4th speed

: 4.50...4.90 travel mm

rpm : 1350 5th speed

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-Lever position

Degree: -1

rpm : 1125

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

C18

1st version Speed rpm : 850 Aneroid pressure h: 1000 Del.quantity : 213.0...220.0) cm3 : 5.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 117...125 Testing: 1st rack travel in: 13.30 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1150...1180 Speed 4th rack travel in: 1250 Speed rpm : 0.00...1.40 LOW IDLE 1 Control lever position degrees: 77...85 Testing: Speed rpm : 100 Minimum rack trave: 6.50 rpm : 250 Rack travel in mm : 4.90...5.10 CONSTANT REGULATION Speed rpm : 270...380Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 600 Pressure hPa : 1000 Rack travel mm : 14.30...14.40 Measurement Speed 1/min: 600 1st pressure hPa : -Rack travel in m: 12.30...12.50 2nd pressure hPa : 420 Rack travel in m: 13.80...13.90 3rd pressure hPa : 310 Rack travel in m: 13.10...13.30 FUEL DELIVERY CHARACTERISTICS 1st version

; 600

rpm

Del.quantity cm3/ : 100.0...110.0 1000 s: (97.0...113.0) cm3 : 10.00 Spread 1000 s: (14.00 Aneroid pressure h: -Speed rpm : 600 Del.quantity cm3/: 167.0...169.0 1000 s: (164.0...172.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.30 rpm : 1040...1050 Speed LOW IDLE Speed rpm : 250 Rack travel in mm : 4.90...5.10

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Remarks:

C19

Speed

Note remarks

: MB 9,6 o 8 : 18.12.92 Test sheet Edition Replaces : 03.92 Test oil : ISO-4113

Combination no. : 0 402 646 965

Injection pump

Pump designation: PE6P120A320LS7834-1

EP type number : 0 412 626 857

Governor

: ROV350...1050PA866 Governor design.

-19

Governer no. : 0 421 813 979

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M401 LA, Euro 1

1st version kW : 213.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar : 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.55)

Rack travel in mm : 20.00...21.00

: 6-3-5-2-4-1 Firing order

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 14.10...14.30

Del.quantity cm3/: 20.7...20.9

100 s: (20.4...21.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0Rack travel in mm : 5.4...6.0

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6 Spread

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.30...1.80

rpm : 570 2nd speed

: 3.30...3.80 travel mm

: 900 3rd speed rom

: 5.40...5.90 travel mm

4th speed : 1107 rpm

: 7.80...8.30 travel mm

5th speed : 1204 rpm

: 9.80...10.30 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1125

Rack travel in mm : 16.50...18.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 600 Aneroid pressure h: 900 : 207.0...209.0 1000 : (204.0...212.0) Del.quantity : 5.00 Spread cm3 1000 : (9.00)RATED SPEED 1st version Control lever position degrees: 115...123 Testing: 1st rack travel in: 13.80 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1180...1210 Speed 4th rack travel in: 1300 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 63...71 Testing: Speed rpm : 200 Minimum rack trave: 7.60 rpm : 350 Rack travel in mm : 5.40...6.00 CONSTANT REGULATION Speed rpm : 350...600 Aneroid/Altitude Compensator Test 1st version Setting : 600 Speed rpm hPa : 900 Pressure Rack travel mm : 14.10...14.30 Measurement 1/min: 600 Speed 1st pressure hPa : 300 Rack travel in m: 10.90...11.10 2nd pressure hPa : 500 Rack travel in m: 12.80...13.00 3rd pressure hPa : 1350 Rack travel in m: 14.40...14.60 4th pressure hPa : -Rack travel in m: 10.60...10.90 START CUT-OUT

Speed 1/min : 270 (290) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1600 Speed : 1050 rom Del.quantity cm3/ : 225.0...228.0 1000 s: (222.0...231.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1600 Speed : 800 rpm Del.quantity cm3/: 226.0...230.0 1000 s: (223.0...233.0) Spread cm3 : 8.00 1000 s: (12.00 Aneroid pressure h: 1600 Speed rpm : 1050
Del.quantity cm3/ : 169.0...173.0 *
1000 s: (166.0...176.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) Spread cm3 : 8.00 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.80 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0) Remarks:

* = Set at reduced-delivery stop.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : SCA

Edition : 22.01.93 Replaces Test oil : ISO-4113

Combination no. : 0 402 646 975

Injection pump

Pump designation : PE6P12DA72ORS7188Y EP type number : 0 412 626 864

Governor

Governor design. : RQV200...950PA725-9

: 0 421 813 988 Governer no.

Customer-spec. information Customer : SCANIA

Engine : DSC 11 38

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 104 assembly

Openina

pressure, bar : 250...253

Orifice plate

diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50 : (4.35...4.55) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - \circ : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 23.5...23.7

100 s: (23.2...24.0)

Spread cm3 : 0.8

100 s: (1.2)

2nd sneed rpm : 250.0 Rack travel in mm: 4.6...5.0 Del.quantity cm3/: 1.4...2.0

100 s: (-) Spread cm3 : 0.4100 s: (0.8)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 250 travel mm : 1.40...1.80

2nd speed rpm : 350

: 2.30...2.90 travel mm 3rd speed rpm : 650

travel mm : 5.20...5.80

rpm : 995 4th speed

: 7.30...7.50 travel mm

5th speed rpm : 1180 travel mm : 8.70...9.10

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1260

Rack travel in mm : 7.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 1500

Del.quantity : 235.0...237.0

1000 : (232.0...240.0)

Spread cm3: 8.00 1000 : (12.00)

RATED SPEED

1st version Control lever

position degrees: 108...116

Testing:

1st rack travel in: 12.20 rpm : 990...1000 Speed 2nd rack travel in: 4.00

rpm : 1180...1210 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 60...68

Testing:

Speed rpm : 125 Minimum rack trave: 6.20 rpm : 250 Speed

Rack travel in mm : 4.60...4.80

Rack travel in mm: 2.00 Speed rpm : 380...440

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rom Pressure hPa : 1500

Rack travel mm : 13.20...13.30

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.20...10.60

2nd pressure hPa : 440

Rack travel in m: 12.00...12.10

3rd pressure hPa : 270

Rack travel in m: 10.90...11.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500 rpm : 950 Speed

Del.quantity cm3/: 216.0...224.0

1000 s: (214.0...226.0)

Aneroid pressure h: -

Speed rom Del.quantity cm3/: 152.0...154.0 1000 s: (149.0...157.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 990...1000

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 150.0...180.0

1000 s: (-)

Rack travel in mm : 10.20...10.60

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO diaphragm.

APPLICATION

Omnibus

BOSCH INJ. PUMP TEST SPECIFICATIONS BEGINNING OF DELIVERY Test pressure, bar: 25...27 Note remarks Prestroke mm : 5.20...5.30 Test sheet : (5.15...5.35) : MB Edition : 05.02.93 Rack travel in mm : 20.00...21.00 : 08.92 Replaces Firing order : 6-3-5-2-4-1 Test oil : ISO-4113 Combination no. : 0 402 646 976 Phasing : 0-60-120-180-240-300 Injection pump Pump designation : PE6P12OA32OLS7846 Tolerance + - ° : 0.50 (0.75) EP type number : 0 412 626 865 Governor Time to cyl. no. : 6 Governor design. : RQ300/1050PA1031 Governer no. : 0 421 801 642 BASIC SETTING Customer-spec. information rpm: 700 1st speed Customer : MERCEDES-BFN7 Rack travel in mm : 13.00...13.10 Engine : 0M401 LA Del.quantity cm3/: 22.9...23.1 : 230.0 1st version kW : 2100 Rated speed 100 s: (22.6...23.4) TEST BENCH REQUIREMENTS cm3 : 0.5Spread Test oil 100 s: (0.9) inlet temp. °C : 38...42 2nd speed rpm : 300.0Overflow valve Rack travel in mm: 4.9...5.5 : 1 417 413 025 Del.guantity cm3/: 1.0...1.6 100 s: (0.7...1.9) Inlet press., bar: 1.50 cm3 : 0.6 Spread 100 s: (1.0) Overflow quantity min. 1/h: 100...120 GUIDE SLEEVE POSITION Control-lever position Test nozzle holder Degree: -2 : 1 688 901 105 assembly rpm : 600 Speed Rack travel in mm : 19.20...20.80 Opening pressure, bar : 207...210 FULL LOAD DELIV. AT FULL LOAD STOP Orifice plate 1st version diameter mm : 0,8 Speed rpm : 700 Aneroid pressure h: 1000 : 229.0...231.0 Del.quantity 1000 : (226.0...234.0) Test lines : 1 680 750 075 Spread : 5.00 cm3Outside diameter 1000 : (9.00)x Wall thickness x Length mm : 8.00x2.50x1000 RATED SPEED (A) Injection pump setting values 1st version

Setting point:

rpm

Rack travel in mm : 20.0

: 600

Speed

Insp. values in parentheses Set equal delivery quant.

per values ____

Testing:

1st rack travel in: 11.60

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

rpm : 1165...1195 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm : 5.2

Testing:

Speed rpm : 200

Minimum rack trave: 7.10 : 300 rpm

Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.35

Torque control curve - 1st version

rpm : 1050 1st speed

Rack travel in m: 12.60...12.80

2nd speed rpm : 700

Rack travel in m: 13.30...13.50

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom Pressure hPa : -

Rack travel mm : 10.10...10.40

Measurement

Speed $1/\min : 500$

1st pressure hPa : 300 Rack travel in m: 10.80...10.90

2nd pressure hPa : 650

Rack travel in m: 12.50...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1050 Del.quantity cm3/: 216.0...220.0

1000 s: (213.0...223.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

rpm : 500

Del.quantity cm3/: 134.0...136.0 1000 s: (131.0...139.0)

cm3 : 8.00 Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 270.0...290.0

1000 s: (266.0...294.0)

Remarks:

Note remarks

Test sheet

: DAF

Edition

: 03.02.93

Replaces

: 07.92

Test oil

: ISO-4113

Combination no. : 0 402 646 988

Injection pump

Pump designation : PE6P120A320RS7230X

EP type number

: 0 412 626 868

Governor

Governor design. : RQV250...1000PA990K

: 0 421 815 274 Governer no.

Customer-spec, information

Customer

Engine

: WS 295 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening.

pressure, bar

: 207...210

Orifice plate

diameter mm

3,0 :

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 980

Rack travel in mm : 13,90...14.00

Del.quantity cm3/: 25.8...26.0

100 s: (25.5...26.3)

Spread

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 250.0

2nd speed Rack travel in mm: 5.8...6.2

Del.quantity cm3/: 1.4...2.0

100 s: (1.1...2.3)

cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 250

: 1.30...1.70 travel mm

2nd speed rpm : 285

travel mm : 2.10...2.50

rpm : 685 3rd speed

: 6.20...6.60 travel mm rpm : 1030

4th speed

: 9.60...10.00 travel mm

5th speed rpm : 1145

: 11.20...11.40 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 12.20...14.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 980

Aneroid pressure h: 1500

Del.quantity : 200.0...263.0)

026

Spread cm3: 5.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 12.90

rpm : 1030...1040 Speed

2nd rack travel in: 4.00

rpm : 1135...1165 Speed

4th rack travel in: 1275

Speed rpm : 0.00...1.40

LOW IDLE 1 Control lever

position degrees: 66...74

Testing:

Speed ma'n : 150 Minimum rack trave: 7.00 : 250 rpm

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

rpm : 320...380 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 400

Rack travel in m: 12.10...12.30

2nd speed rpm : 600

Rack travel in m: 12.30...12.40

3rd speed rpm : 825

Rack travel in m: 13.30...13.50

4th speed rpm : 980

Rack travel in m: 14.20...14.40

Aneroid/Altitude Compensator Test

1st version

Setting Speed

rpm : 980 hPa : 1500 Pressure

Rack travel mm : 13.90...14.00

Measurement

1/min: 980 Speed

1st pressure hPa : -

Rack travel in m: 8.70...8.90

2nd pressure hPa : 730

Rack travel in m: 12.60...12.70

3rd pressure hPa : 300

Rack travel in m: 9.70...9.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500 Speed rpm : 600

Del.quantity cm3/: 255.0...259.0

1000 s: (252.0...262.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -Speed rpm : 600

Del.quantity cm3/: 159.0...161.0

1000 s: (156.0...164.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.90

Speed rpm : 1030...1040

LOW IDLE

Speed man : 250

Rack travel in mm : 5.10...5.30

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet Edition

: DAF

Replaces

: 18.12.92 : 04.92

Test oil

: ISO-4113

Combination no. : 0 402 646 989

Injection pump

Pump designation : PE6P120A320RS7230Y

EP type number

: 0 412 626 867

Governor

Governor design. : RQV250...1000PA990K

Governer no. : 0 421 815 274

Customer-spec. information Customer

: DAF

Engine

: WS 315 L

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 14.00...15.00

Firing order

: 1-5-3-6-2-4

Phasina

: 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 980

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 27.3...27.5

100 s: (27.0...27.8)

Spread

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 250.0

Rack travel in mm: 5.8...6.2 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3) cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed travel mm

rpm : 250 : 1.30...1.70

rpm : 285 2nd speed

travel mm

: 2.10...2.50

3rd speed

rpm : 685

travel mm

: 6.20...6.60

4th speed travel mm rpm : 1030

5th speed

: 9.60...10.00

rpm : 1145

travel mm : 11.20...11.40

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 12.20...14.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 980

Aneroid pressure h: 1500

Del.quantity : 273.0...278.0)

C28

Spread

: 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 116...124

Testina:

1st rack travel in: 13.50

rpm : 1030...1040 Speed

2nd rack travel in: 4.00

rpm : 1135...1165 Speed

4th rack travel in: 1275

rpm : 0.00...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 66...74

Testing:

Speed rpm : 150

Minimum rack trave: 7.00

Speed : 250 rom

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

rpm : 320...360 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 400

Rack travel in m: 12.90...13.10

rpm : 600 2nd speed

Rack travel in m: 12.90...13.10

3rd speed rpm : 800

Rack travel in m: 13.90...14.10

rpm : 980 4th speed

Rack travel in m: 14.80...15.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 980 hPa : 1500 Pressure

Rack travel mm : 14.50...14.60

Measurement

Speed 1/min: 980

1st pressure hPa : -

Rack travel in m: 8.90...9.10

2nd pressure hPa : 760

Rack travel in m: 13.10...13.20 3rd pressure hPa : 350

Rack travel in m: 10.20...10.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

Speed rpm : 600 Del.quantity cm3/ : 281.0...285.0 1000 s: (278.0...288.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

rpm : 600 Speed Del.quantity cm3/: 168.0...170.0

1000 s: (165.0...173.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 1030...1040

LOW IDLE

Speed rpm : 250

Rack travel in mm : 5.10...5.30

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

:

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : FIA 17,2 e Edition : 18.12.92 Replaces : 11.92 Test oil : ISO-4113 Combination no. : 0 402 648 854 Injection pump EP type number : 0 412 638 802 Governor Governor design. : RQV300...950PA905 Governer no. : 0 421 813 723 Customer-spec. information Customer : IVECO-FIAT Engine : 8280.42.001 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 40...45 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 688 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses

Pump designation : PE8P130A92C/5LS7822 Set equal delivery quant. per values ____ BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 5.10...5.20 Prestroke mm : (5.05...5.25) Rack travel in mm : 9.00...12.00

Firing order : 1-8-4- 3- 6- 5-Phasing : 0-45-90-135-180-225-270-315 Tolerance + -- ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 550 Rack travel in mm : 11.40...11.50 Del.quantity cm3/: 22.1...22.3 100 s: (21.8...22.6) Spread cm3 : 0.8100 s: (1.2) 2nd speed rpm : 300.0Rack travel in mm : 4.8...5.2 Del.quantity cm3/: 2.4...3.0 100 s: (2.0...3.4) cm3 : 0.6 100 s: (1.0) Spread (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 225 travel mm : 0.60...1.10 2nd speed rpm : 350 travel mm : 2.10...2.50 3rd speed rpm : 600 travel mm : 3.80...4.40 rpm : 950 4th speed : 7.20...7.40 travel mm 5th speed rpm : 1200 travel mm : 11.00...12.00 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1020Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 550

Aneroid pressure h: 900

Del.quantity : 221.0...226.0)

Spread

cm3: 3.00

1000 : (12.00)

RATED SPEED

1st version

Control lever

position degrees: 109...117

Testing:

1st rack travel in: 10.40

rpm : 995...1005 Speed

2nd rack travel in: 4.00

Speed rpm : 1030...1110

4th rack travel in: 1200

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 63...71

Testing:

Speed rpm : 200

Minimum rack trave: 6.50

Speed rpm : 300

Rack travel in mm : 4.90...5.10

CONSTANT REGULATION

rpm : 380...480 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

Speed : 500 rpm Pressure hPa : 900

: 11.40...11.50 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.30...9.60

2nd pressure hPa : 390

Rack travel in m: 10.90...11.00

3rd pressure hPa : 330

Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 950 Del.quantity cm3/: 215.0...221.0

1000 s: (212.0...224.0)

Aneroid pressure h: -

Speed : 500 rpm

Del.quantity cm3/: 161.0...163.0

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.40

Speed rpm : 995...1005

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 235.0...265.0

1000 s: (231.0...269.0)

1000 s: (158.0...166.0)

Remarks:

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet : MB

Edition : 18.12.92 Replaces : 10.92

Test oil : ISO-4113

Combination no. : 0 402 648 899

Injection pump

Pump designation : PE8P120A320LS7839-10

EP type number : 0 412 628 855

Governor

Governor design. : R0300/950PA971-5

Governer no. : 0 421 801 559

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0

Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00X2.50X1000

* Eergen 0.00x2.00x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

4- 1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance $+ - \circ : 0.50 (0.75)$

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 550

Rack travel in mm : 15.10...15.30

Del.quantity cm3/: 26.5...26.7

100 s: (26.2...27.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 6.0...6.6

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread cm3:0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm: 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 900

Del.quantity : 265.0...267.0

1000 : (262.0...270.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.30 Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1075...1105

4th rack travel in: 1150

rpm : 0.00...1.50 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.3

Testing:

Speed rpm : 200

Minimum rack trave: 7.60

rpm : 300

Rack travel in mm : 6.20...6.40

Rack travel in mm : 2.00

rpm : 370...410 Speed

Aneroid/Altitude Compensator Test

1st version Settina

Speed : 400 rom Pressure hPa : 900

Rack travel mm : 15.10...15.30

Measurement

1/min: 400 Speed

1st pressure hPa : 250

Rack travel in m: 10.00...10.20

2nd pressure hPa : 550

Rack travel in m: 12.80...12.90

3rd pressure hPa : 1100

Rack travel in m: 15.20...15.40 4th pressure hPa : 1300

Rack travel in m: 15.60...15.70

5th pressure hPa : -

Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000

: 950 Speed rpm

Del.quantity cm3/ : 281.0...284.0

1000 s: (278.0...287.0)

cm3 : 8.00Spread

1000 s: (12.0)

Aneroid pressure h: -Speed rpm : 500

Del.quantity cm3/: 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.30

rpm : 990...1005 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 80.0...100.0

1000 s: (76.0...104.0)

Rack travel in mm : 9.10...9.50

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet

: MB

Edition

: 18.12.92

Replaces

: 10.92

Test oil

: ISO-4113

Combination no. : 0 402 648 902

Injection pump

Pump designation : PE8P120A320LS7839-10

EP type number

: 0 412 628 855

Governor

Governor design. : RQ300/1050PA972-5

Governer no.

: 0 421 801 564

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M442 LA

1st version kW

: 370.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet tempo. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

Orifice plate

diameter mm

: 0,8

: 207...210

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 550

Rack travel in mm : 15.10...15.30

Del.quantity cm3/: 26.5...26.7

100 s: (26.2...27.0)

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

Spread

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

000 : man

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 550

Aneroid pressure h: 900

Del.quantity

: 265.0...267.0 1000 : (262.0...270.0)

cm3

: 6.00

Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed

rom

: 600

Rack travel in mm: 20.0 Testina: 1st rack travel in: 15.20 Speed rpm : 1090...1105 2nd rack travel in: 4.00 грт : 1160...1190 Speed 4th rack travel in: 1250 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring 1200° : 300° Rack travel in mm: 6.3 Testing: Speed rpm : 200 Minimum rack trave: 7.80 rpm : 300 Rack travel in mm : 6.20...6.40 Rack travel in mm: 2.00 Speed rpm : 380...420 TORQUE CONTROL Dimension a mm :? 2nd speed rpm : 1050 Rack travel in m: 16.20...16.40 3rd speed rpm : 800 Rack travel in m: 16.40...16.60 Aneroid/Altitude Compensator Test 1st version Setting : 400 Speed rpm Pressure hPa : 900 Rack travel mm : 15.10...15.30 Measurement $1/\min:400$ Speed 1st pressure hPa : 250 Rack travel in m: 10.00...10.20 2nd pressure hPa : 550 Rack travel in m: 12.80...12.90 3rd pressure hPa : 1100 Rack travel in m: 15.20...15.40 4th pressure hPa : 1300 Rack travel in m: 15.60...15.70 5th pressure hPa : -Rack travel in m: 9.10...9.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 2000 Speed rpm : 1050

Del.quantity cm3/: 271.0...274.0 1000 s: (268.0...277.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: 2000 : 800 Speed rom Del.quantity cm3/: 283.0...287.0 1000 s: (280.0...290.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) Spread cm3 : 8.001000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 15.20 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 9.10...9.50

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

D07

Note remarks

Test sheet

: Me

Edition

: 18,12,92

Replaces

: 10.92

Test oil

: ISO-4113

Combination no. : 0 402 648 911

Injection pump

Pump designation : PE8P120A320LS7839-10

EP type number

: 0 412 628 855

Governor

Governor design.

: RQV300...1050PA797

-27

Governer no.

: 0 421 813 916

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M442 LA

1st version kW

: 370.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Openina

pressure, bar

Orifice plate

diameter mm

: 0,8

: 207...210

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 20.00...21.00

Firing order

: 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 550

Rack travel in mm : 15.10...15.30

Del.quantity cm3/: 26.5...26.7

100 s: (26.2...27.0)

Spread

cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm: 6.0...6.6

Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 1.00...1.50 travel mm

rpm : 558 2nd speed travel mm

3rd speed

: 4.30...4.80 rpm : 820

travel mm

: 5.90...6.40

4th speed travel mm rpm : 1108 : 8.30...8.80

5th speed

Speed

rpm : 1183

travel mm

: 8.30...8.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130

Rack travel in mm : 15.20...17.80

800

FULL LOAD DELIV. AT FULL LOAD STOP Rack travel in m: 12.80...12.90 3rd pressure hPa : 1100
Rack travel in m: 15.20...15.40
4th pressure hPa : 1300
Rack travel in m: 15.60...15.70 1st version Speed rpm : 550Arieroid pressure h: 900 Del.quantity : 265.0...267.0 5th pressure hPa : -1000 : (262.0...270.0) Rack travel in m: 9.10...9.40 Spread cm3 : 6.00 1000 : (9.00) START CUT-OUT RATED SPEED Speed 1/min : 220 (240) 1st version FUEL DELIVERY CHARACTERISTICS Control lever position degrees: 118...126 1st version Testing: Aneroid pressure h: 2000 1st rack travel in: 15.20 Speed rpm : 1050 Speed rpm : 1090...1100 Del.quantity cm3/: 271.0...274.0 2nd rack travel in: 4.00 1000 s: (268.0...277.0) rpm : 1175...1205 Speed cm3 : 8.00Spread 4th rack travel in: 1250 1000 s: (12.0) Speed rpm : 0.00...1.50Aneroid pressure h: 2000 Speed rpm: 800
Del.quantity cm3/: 283.0...287.0
1000 s: (280.0...290.0)
Spread cm3: 8.00 LOW IDLE 1 Control lever position degrees: 76...84 1000 s: (12.0) Testing: Ameroid pressure h: -: 200 Speed Speed rom rpm : 500 Minimum rack trave: 6.80 Del.quantity cm3/: 132.0...134.0 rpm : 300 1000 s: (129.0...137.0) Rack travel in mm : 6.20...6.40 Spread cm3 : 8.00 1000 s: (12.0) CONSTANT REGULATION Speed rpm : 300...450 BREAKAWAY TORQUE CONTROL Dimension a mm : 0.20 1st version 2nd speed rpm : 1050 1mm rack travel less than Rack travel in m: 16.20...16.40 3rd speed rpm : 800 full load rack tr: 15.20 Rack travel in m: 16.40...16.60 Speed rpm : 1090...1100 Aneroid/Altitude STARTING FUEL DELIVERY Compensator Test Speed rpm : 100 Del.quantity cm3/ : 275.0...295.0 1000 s: (271.0...299.0) 1st version Setting Speed וחמיז : 400 hPa : 900 Pressure Remarks: Rack travel mm : 15.10...15.30 Measurement * Increase in control-rod travel with Speed $1/\min : 400$ respect to setting at least 0.1 mm 1st pressure hPa : 250 Rack travel in m: 10.00...10.20

009

2nd pressure hPa : 550

Note remarks

Test sheet : FIA 17,2 f Edition : 21.01.93

Replaces : 07.92 Test oil : ISO-4113

Combination no. : 0 402 648 912

Injection pump

Pump designation : PE8P130A920/5LS7841

EP type number : 0 412 638 803

Governor

Governor design. : RQV300...950PA994K

Governer no. : 0 421 815 275

Customer-spec, information Customer : IVECO-FIAT

Engine : 8280.42.050

TEST BENCH REQUIREMENTS

Test oil

: 38...42 inlet temp. 'C

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm 3,0:

Test Lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ___

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm : (4.95...5.15)

Rack travel in mm : 11.50...12.50

Firing order

: 1-8-4- 3-6-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.90...6.10 & maximum rack tra: 11.5...12.5 Difference ° CS : 1.25...2.75

BASIC SETTING

1st speed rpm: 550

Rack travel in mm: 10.50...10.60

Del.quantity cm3/: 21.4...21.6

100 s: (21.4...21.6)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 300.0Rack travel in mm : 4.0...4.4Del.quantity cm3/ : 2.2...2.8

100 s: (1.9...3.1) cm3 : 0.5

100 s: (0.9)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

Spread

rpm : 995 1st speed

: 9.60...9.80 travel mm

2nd speed : 300 rpm

2.50...2.70 travel mm

3rd speed rpm : 500

: 4.10...4.70 travel mm

4th speed rpm : 700

travel mm : 5.90...6.50

5th speed rpm : 1250

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1080 Speed

Rack travel in mm : 8.10...10.70

FULL LOAD DELIV. AT FULL LOAD STOP

D10

1st version 1st pressure hPa : -Speed rom : 550Rack travel in m: 7.30...7.50 Aneroid pressure h: 900 2nd pressure hPa : 360 Rack travel in m: 9.70...9.80 3rd pressure hPa : 260 Del.quantity : 214.0...216.0 1000 : (214.0...216.0) Spread cm3: 8.00 Rack travel in m: 8.10...8.30 1000 : (12.00) START CUT-OUT RATED SPEED 1/min: 220 (240) Speed 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 108...116 Testing: 1st version 1st rack travel in: 9.40 Aneroid pressure h: 900 Speed rpm : 950 Del.quantity cm3/ : 214.0...220.0 1000 s: (214.0...220.0) rpm : 990...1000 Speed 2nd rack travel in: 4.00 Speed rpm : 1035...1065 4th rack travel in: 1200 : 550 Speed man rpm : 0.00...1.00Del.quantity cm3/ : 145.0...155.0 Speed 1000 s: (142.0...158.0) LOW IDLE 1 cm3 : 10.00Spread Control lever 1000 s: (14.00 position degrees: 58...66 Aneroid pressure h: -Speed : 500 rpm Del.quantity cm3/: 139.0...141.0 1000 s: (139.0...141.0) Testing: Speed rpm : 200 Minimum rack trave: 5.70 Speed rpm : 300 Rack travel in mm : 4.10...4.30 BREAKAWAY CONSTANT REGULATION 1st version Speed rpm : 170...290 1mm rack travel less than TORQUE CONTROL full load rack tr: 9.40 Dimension a mm :? Speed rpm : 990...1000 Torque control curve - 1st version 1st speed rpm : 550 STARTING FUEL DELIVERY Rack travel in m: 10.50...10.60 d speed rpm : 950 2nd speed Rack travel in m: 10.40...10.60 d speed rpm : 700 Speed rpm : 100 Del.quantity cm3/: 150.0...180.0 3rd speed Rack travel in m: 10.40...10.70 1000 s: (146.0...184.0) rpm : 350 4th speed Rack travel in m: 10.00...10.30 LOW IDLE Speed rpm : 300 Rack travel in mm : 4.00...4.40 Del.quantity cm3/ : 22.0...28.0 1000 s: (19.0...31.0) Aneroid/Altitude Compensator Test 1st version Setting Spread cm3 : 5.00 1000 s: (9.00) Speed : 950 rpm hPa : 900 Pressure Remarks: : 10.50...10.60 Rack travel mm Measurement Setting and blocking of pointer of 1/min : 950Speed start-of-delivery sensor on cyl. 1

D11

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 18.12.92 Edition : 10.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 917 Injection pump Pump designation : PE8P120A320LS7839-10 : 0 412 628 855 EP type number Governor Governor design. : RQ300/1050PA993-3 : 0 421 801 601 Governer no. Customer-spec. information : MERCEDES-BENZ Customer Engine : 0M442 LA 1st version kw : 370.0 : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow. quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 105 assembly Opening pressure, bar : 207...210 Orifice plate

diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant, per values ___

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.00...5.10 : (4.95...5.15) Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-Firing order Phasing : 0-45-90-135-180-225-270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rom: 600

Rack travel in mm : 15.10...15.30 Del.quantity cm3/: 26.5...26.7 100 s: (26.2...27.0) Spread cm3 : 0.6

100 s: (0.9) 2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.6Spread 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position Degree: -2

Speed rpm : 600 Rack travel in mm: 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 600 Aneroid pressure h: 900 : 265.0...267.0 Del.quantity 1000 : (262.0...270.0)

cm3 Spread : 6.00 1000 : (9.00)

RATED SPEED

1st version Setting point:

Speed rom : 600

013

Rack travel in mm: 20.0 1st version Testing: 1st rack travel in: 15.20 Speed rpm : 1090...1105 2nd rack travel in: 4.00 Speed rpm : 1160...1190 Spread 4th rack travel in: 1250 rpm : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Spread Rack travel in mm: 6.3 Testing: Speed Speed : 200 riom Minimum rack trave: 7.20 : 300 rpm Spread Rack travel in mm : 6.20...6.40 Rack travel in num: 2.00 rpm : 380...420Speed TORQUE CONTROL Dimension a mm : 1050 2nd speed rpm Rack travel in m: 16.20...16.40 3rd speed rpm : 800 Rack travel in m: 16.40...16.60 Speed Aneroid/Altitude Compensator Test Speed 1st version Settina Speed : 400 ron Pressure hPa : 900 Remarks: Rack travel mm : 15.10...15.30 Measurement Speed 1/min: 400 1st pressure hPa : 250 Rack travel in m: 10.00...10.20 2nd pressure hPa : 550 Rack travel in m: 12.80...12.90
3rd pressure hPa : 1100
Rack travel in m: 15.20...15.40
4th pressure hPa : 1300 Rack travel in m: 15.60...15.70 5th pressure hPa : Rack travel in m: 9.10...9.40 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 2000 rpm : 1050 Del.quantity cm3/: 271.0...274.0 1000 s: (268.0...277.0) cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 2000 Speed rpm : 800 Del.quantity cm3/ : 283.0...287.0 1000 s: (280.0...290.0) cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm Del.quantity cm3/: 132.0...134.0 1000 s: (129.0...137.0) cm3 : 8.001000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 15.20

rpm : 1090...1105

STARTING FUEL DELIVERY

: 100 rpm

Del.quantity cm3/: 275.0...295.0 1000 s: (271.0...299.0)

* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet

: MB

Edition

: 18.12.92

Replaces

: 10.92

Test oil

: ISO-4113

Combination no. : 0 402 648 921

Injection pump

Pump designation : PE8P120A320LS7839-10

EP type number

: 0 412 628 855

Governor

Governor design. : RQ300/950PA993-8

Governer no.

: 0 421 801 618

Customer-spec. information

Customer

MERCEDES—BENZ

Engine

: OM442 LA

1st version kW

: 370.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Openina (

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.00...5.10

: (4.95...5.15)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 550

Rack travel in mm : 15.10...15.30

Del.quantity cm3/: 26.5...26.7

100 s: (26.2...27.0)

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 6.0...6.6

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

Spread

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 550

Aneroid pressure h: 900

Del.quantity

: 265.0...267.0

1000 : (262.0...270.0)

Spread

: 6.00 cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed

rpm

: 600

Rack travel in mm : 20.0 Testing: 1st rack travel in: 15.30 Speed rpm : 990...1005 2nd rack travel in: 4.00 rpm : 1075...1105 Speed 4th rack travel in: 1150 rom : 0.00...1.50 Speed LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.3 Testing: Speed rpm : 200 Minimum rack trave: 7.60 rpm : 300 Rack travel in mm : 6.20...6.40 Rack travel in nm : 2.00 Speed rpm : 380...420 Aneroid/Altitude Compensator Test 1st version Setting Speed man : 400 hPa : 900 Pressure Rack travel mm : 15.10...15.30 Measurement Speed 1/min: 400 1st pressure hPa : 250 Rack travel in m: 10.00...10.20 2nd pressure hPa : 550 Rack travel in m: 12.80...12.90 3rd pressure hPa : 1100

Rack travel in m: 15.20...15.40
4th pressure hPa : 1300

Rack travel in m: 15.60...15.70 5th pressure hPa : -Rack travel in m: 9.10...9.40 START CUT-OUT

1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 2000 Speed rpm : 950 Del.quantity cm3/: 281.0...284.0 1000 s: (278.0...287.0)

cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Del.quantity cm3/ : 132.0...134.0 1000 s: (129.0...137.0) cm3 : 8.00Spread 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 15.30 Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 260.0...280.0 1000 s: (256.0...284.0)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : 18 Edition : 11.01.93 Replaces : 08.92 Test oil : ISO-4113 Combination no. : 0 402 648 928 Injection pump Pump designation : PE8P120A320LS7847 EP type number : 0 412 628 863 Governor Governor design. : RQ300/1050PA1030 : 0 421 801 640 Governer no. Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M402 LA 1st version kw : 280.0 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Opening. pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm

Test lines : 1 680 750 075

Outside diameter x Wall thickness x Length mm : 8.00x2.50x100

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY
Test pressure, bar: 25...27

: 5.50...5.60 : (5.45...5.65) Prestroke mm Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-Phasing : 0-45-90-135-180-225-270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rpm : 700Rack travel in mm : 13.40...13.50 Del.quantity cm3/: 23.3...23.5 100 s: (23.0...23.8) Spread cm3 : 0.6100 s: (0.9) 2nd speed rpm : 300.0 Rack travel in mm: 5.2...5.8 Del.guantity cm3/: 1.0...1.6 100 s: (0.7...1.9) Spread cm3 : 0.6100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 Speed rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 Aneroid pressure h: 1200 Deliquantity : 233.0...235.0 1000 : (230.0...238.0) Spread cm3 : 6.00 1000 : (9.00) RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1170...1260 Speed 4th rack travel in: 1350 rom : 0.00...1.50Speed LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 5.5 Testina: Speed : 200 rom Minimum rack trave: 7.60 : 300 Speed rom Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 : 360...400 Speed rpm TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version 1st speed rpm : 1050 Rack travel in m: 12.80...13.00 2nd speed rpm : 800 Rack travel in m: 13.40...13.60 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 L DUI Pressure hPa : -Rack travel mm : 10.30...10.60 Measurement $1/\min : 500$ Speed 1st pressure hPa : 300 Rack travel in m: 11.10...11.20 2nd pressure hPa : 650 Rack travel in m: 12.60...12.80 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1050 Del.quantity cm3/ : 206.0...209.0 1000 s: (203.0...212.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 131.0...133.0

1000 s: (128.0...136.0)

Spread cm3 : 8.00 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.80

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm_ : 100

Del.quantity cm3/: 45.0...65.0 1000 s: (41.0...69.0)

Rack travel in mm : 10.50...10.70

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB : 11.01.93 Edition Replaces : 08.92 Test oil : ISO-4113 Combination no. : 0 402 648 930 Injection pump Pump designation : PE8P120A320LS7847 EP type number : 0 412 628 863 Governor Governor design. : RQ300/1050PA1031-2 Governer no. : 0 421 801 645 Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M402 LA 1st version kW : 280.0 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 105 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075

Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-Phasing : 0-45-90-135-180-225-270-315 Tolerance + - ° : 0.50 (0.75)Time to cyl. no. : 8 BASIC SETTING 1st speed rpm:700Rack travel in mm : 13.40...13.50 Del.quantity cm3/ : 23.3...23.5 100 s: (23.0...23.8) Spread cm3 : 0.6100 s: (0.9) 2nd speed rpm : 300.0Rack travel in mm: 5.2...5.8 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.9) Spread cm3 : 0.6100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 Speed rpm : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700Aneroid pressure h: 1200 : 233.0...235.0 Del.quantity

1000 : (230.0...238.0)

Spread cm3 : 6.00 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.80

Speed rpm : 1090...1105 2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1350

rpm : 0.00...1.50Speed

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 5.5

Testing:

Speed rpm : 200 Minimum rack trave: 7.60

Speed rpm : 300

Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00

Speed rpm : 370...410

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm

Pressure hPa

Rack travel mm : 10.30...10.60

Measurement

Speed $1/\min : 500$

1st pressure hPa : 300

Rack travel in m: 11.10...11.20

2nd pressure hPa : 650

Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 1050

Del.quantity cm3/: 206.0...209.0

1000 s: (203.0...212.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 131.0...133.0 1000 s: (128.0...136.0)

Spread

cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.80

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 250.0...290.0

1000 s: (246.0...294.0)

Remarks:

020

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : LIE : 18.12.92 Test sheet Edition : 07.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 932 Injection pump Pump designation : PE8P120A320L57849 EP type number : 0 412 628 864 Governor Governor design. : RQV300...1050PA1034 Governer no. : 0 421 813 993 Customer-spec. information Customer : LIEBHERR : D 9308 TI Engine 1st version kW : 360.0 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 105 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 4.50...4.60 : (4.45...4.65) Rack travel in mm : 9.00...12.00 Firing order : 1-8-7-2-6-3-Phasing : 0-45-90-135-180-225-270-315 Tolerance + - ° : 0.50 (0.75)BASIC SETTING 1st speed rpm : 1050Rack travel in mm : 15.00...15.10 Del.quantity cm3/: 26.2...26.4 100 s: (25.9...26.7) Spread cm3 : 0.5100 s: (0.9) rpm : 350.02nd speed Rack travel in mm : 5.1...5.5 Del.quantity cm3/ : 1.8...2.4 100 s: (1.5...2.7) Spread cm3 : 0.6100 s: (1.0) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 350 : 1.70...2.10 travel mm rpm : 405 2nd speed travel mm : 2.40...2.90 3rd speed rpm : 550 travel mm : 4.20...4.60 4th speed rpm : 780 : 6.30...6.90 travel mm 5th speed rpm : 1118 : 10.40...10.60 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1185 Speed Rack travel in mm : 12.70...15.30 FULL LOAD DELIV. AT FULL LOAD STOP 1st version

rpm : 1050

Aneroid pressure h: 1500

Prestroke mm

Speed

Del.quantity : 262.0...264.0

1000 : (259.0...267.0)

Spread : 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 103...111

Testina:

1st rack travel in: 14.00

rpm : 1100...1110 Speed

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.40

LOW IDLE 1 Control lever

position degrees: 68...76

Testing:

Speed : 250 rpm Minimum rack trave: 8.50 Speed : 350 man

Rack travel in mm : 5.20...5.40

Rack travel in mm : 2.00

Speed : 430...490 man

CONSTANT REGULATION

Speed : 350...420 riom

Aneroid/Altitude Compensator Test

1st version Setting

Speed **man** : 700

Pressure hPa : 1500

Rack travel mm : 15.00...15.10

Measurement

1/min: 700 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 1130

Rack travel in m: 14.10...14.20

3rd pressure hPa : 870

Rack travel in m: 12.50...12.70

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Ameroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 193.5...195.5

1000 s: (190.5...198.5)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

Speed rpm : 1100...1110

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/ : 155.0...175.0

1000 s: (151.0...179.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.10...5.50 Del.quantity cm3/: 18.0...24.0

1000 s: (15.0...27.0)

Spread cm3 : 6.00

1000 s: (10.00)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : LIE : 18.12.92 Edition : 06.92 Replaces : ISO-4113 Test oil Combination no. : 0 402 648 932A Injection pump Pump designation: PE8P120A320LS7849 EP type number : 0 412 628 864 Governor Governor design: : RQV300...1050PA1034 : 0 421 813 993 Governer no. Customer-spec. information Customer : LIEBHERR Engine : D 9308 TI 1st version kW : 360.0 : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness

: 8.00x2.50x1000

(A) Injection pump setting values

per values

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

Insp. values in parentheses Set equal delivery quant.

: (4.45...4.65) Rack travel in mm : 9.00...12.00 : 1-8-7-2-6-3-Firing order : 0-45-90-135-130-225-Phasing 270~315 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed rpm : 1050Rack travel in mm : 15.00...15.10 Del.quantity cm3/: 26.2...26.4 100 s: (25.9...26.7) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 350.0Rack travel in mm: 5.1...5.5 Del.quantity cm3/: 1.8...2.4 100 s: (1.5...2.7) cm3 : 0.6Spread 100 s: (1.0) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 350 1st speed : 1.70...2.10 travel mm 2nd speed rpm : 405 : 2.40...2.90 travel mm 3rd speed rpm : 550 travel mm : 4.20...4.60 4th speed rpm : 780 : 6.30...6.90 travel mm rpm : 1118 5th speed : 10.40...10.60 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1185 Speed Rack travel in mm : 12.70...15.30 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1050Aneroid pressure h: 1500

: 4.50...4.60

Prestroke mm

x Length mm

: 262.0...264.0 Deliquantity

1000 : (259.0...267.0)

cm3: 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 103...111

Testing:

1st rack travel in: 14.00

rpm : 1100...1110 Speed

2nd rack travel in: 4.00

Speed rpm : 1200...1230

4th rack travel in: 1300

mpm : 0.00...1.40Speed

LCW IDLE 1 Control lever

position degrees: 68...76

Testing:

Speed : 250 rpm Minimum rack trave: 8.50 : 350 man

Rack travel in mm : 5.20...5.40

Rack travel in mm: 2.00

Speed : 430...490 rpm

CONSTANT REGULATION

rpm : 350...420 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 700 rom Pressure hPa : 1500

: 15.00...15.10 Rack travel mm

Measurement

1/min : 700 Speed

1st pressure hPa : -

Rack travel in m: 11.70...11.90

2nd pressure hPa : 1130

Rack travel in m: 14.10...14.20

3rd pressure hPa : 870

Rack travel in m: 12.50...12.70

START CUT-OUT

1/min : 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 193.5...195.5

1000 s: (190.5...198.5)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

rpm : 1100...1110 Speed

STARTING FUEL DELIVERY

: 100 Speed rpm

Del.quantity cm3/: 155.0...175.0

1000 s: (151.0...179.0)

Rack travel in mm : 20,00...21.00

LOW IDLE

Speed rpm : 350 Rack travel in mm : 5.10...5.50

Del.quantity cm3/: 18.0...24.0

1000 s: (15.0...27.0)

cm3 : 6.00 Spread

1000 s: (10.00)

Remarks:

Note remarks

Test sheet

: MB

Edition

: 31.08.92

Replaces

: 06.92

Test oil

: 150-4113

Combination no. : 0 402 648 939

Injection pump

Pump designation : PE8P120A320LS7851

EP type number

: 0 412 628 865

Governor

Governor design.

: RQV300...1050PA797

-37

Governer no.

: 0 421 814 003

Customer-spec, information

Customer

: MERCEDES-BENZ

Engine

: 0M442 LA

1st version kW

: 405.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp, °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter x Wall thickness

x Length mm

: 8.00x2.50x1000

Insp. values in parentheses

(A) Injection pump setting values

Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 4.70...4.80

: (4.65...4.85)

Rack travel in mm : 20.00...21.00

Firing order

: 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

Spread

Spread

rpm : 1050

Rack travel in mm : 14.40...14.60

Del.quantity cm3/: 28.1...28.3

100 s: (27.8...28.6)

cm3 : 0.6

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm: 5.6...6.2

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

: 0.50...1.00 travel mm

2nd speed rpm : 575 travel mm

: 4.30...4.80

3rd speed rpm : 830 travel mm

: 5.90...6.40 rpm : 1108

4th speed travel mm

: 8.10...8.60

5th speed rpm

travel mm

: 1190 : 9.70...10.20

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1130 Rack travel in mm : 12.10...14.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1050 Speed Aneroid pressure h: 1300

: 281.0...283.0 Del.quantity

1000 : (278.0...286.0)

: 6.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 13.40

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

Speed rpm : 1160...1190

4th rack travel in: 1250

rpm : 0.00...1.50Speed

LOW IDLE 1 Control lever

position degrees: 78...86

Testina:

: 200 Speed rpm Minimum rack trave: 7.20 rpm : 300

Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Speed rpm : 380...420

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed rpm hPa : 1300 Pressure

: 14.40...14.60 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : Rack travel in m: 7.90...8.10

2nd pressure hPa : 500 Rack travel in m: 9.20...9.40

3rd pressure hPa : 1000

Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300

Speed rpm : 600 Del.quantity cm3/: 292.5...296.5

1000 s: (289.5...299.5)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

rpm : 500 **Deea**

Del.quantity cm3/: 131.0...133.0 1000 s: (128.0...136.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.40

rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 80.0...100.0

1000 s: (76.0...104.0)

Remarks:

Note remarks

Test sheet : MB

Edition : 18.12.92

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 939

Injection pump

Pump designation : PE8P120A320LS7863-1

EP type number : 0 412 628 876

Governor:

Governor design. : RQV300...1050PA797

-37

: 0 421 814 003 Governer no.

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 405.0 : 2100 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.70...4.80

: (4.65...4.85)

Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 14.40...14.60

Del.quantity cm3/: 28.1...28.3

100 s: (27.8...28.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm : 5.6...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 0.50...1.00

2nd speed : 575 rpm

: 4.30...4.80 travel mm

3rd speed : 830 rom

: 5.90...6.40 travel mm

4th speed rpm : 1108

travel mm : 8.10...8.60

5th speed : 1190 rpm

: 9.70...10.20 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 12.10...14.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050Aneroid pressure h: 1300

Del.quantity : 281.0...283.0

1000 : (278.0...286.0)

: 6.00 Spread cm3 1000 : (9.60)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 13.40

rpm : 1090...1105 Speed

2nd rack travel in: 4.00

rpm : 1160...1190 Speed

4th rack travel in: 1250

Speed rpm : 0.00...1.50

LOW IDLE 1 Control lever

position degrees: 78...86

Testing:

Speed : 200 rpm Minimum rack trave: 7.20 : 300 rpm

Rack travel in mm : 5.80...6.00

CONSTANT REGULATION

Spead rpm : 38J...420

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rom hPa : 1300 Pressure

Rack travel mm : 14.40...14.60

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 7.90...8.10

2nd pressure hPa : 500

Rack travel in m: 9.20...9.40

3rd pressure hPa : 1000

Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300

Speed rpm : 600 Del.quantity cm3/ : 292.5...296.5

1000 s: (289.5...299.5)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 131.0...133.0 1000 s: (128.0...136.0)

cm3 : 8.00 Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.40

rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 80.0...100.0

1000 s: (76.0...104.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : 11.01.93 : 08.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 940 Injection pump Pump designation : PE8P120A320LS7847 EP type number : 0 412 628 863 Governor Governor design. : RQ300/950PA1032-4 : 0 421 801 661 Governer no. Customer-spec. information : MERCEDES-BENZ Customer : 0M402 LA Engine 1st version kW : 280.0 Rated speed : 1900 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 105 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8

: 1 680 750 075

: 8.00x2.50x1000

Phasing Tolerance + - ° BASIC SETTING 1st speed Spread 2nd speed Spread Speed 1st version Speed Del.quantity Spread cm3 RATED SPEED 1st version Setting point: Speed rpm

BEGINNING OF DELIVERY

Test pressure, bar: 25...27 Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 : 8-7-2-6-3-5-Firing order : 0-45-90-135-180-225-270-315 : 0.50 (0.75) Time to cyl. no. : 8 rpm: 600 Rack travel in mm : 13.30...13.40 Del.quantity cm3/: 22.8...23.0 100 s: (22.5...23.3) cm3 : 0.6100 s: (0.9) rpm : 300.0Rack travel in mm: 5.2...5.8 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.9) cm3 : 0.6 100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Rack travel in mm: 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP rpm : 600 Aneroid pressure h: 1200 : 228.0...230.0 1000 : (225.0...233.0) : 6.00 1000 : (9.00) : 600

Test lines

x Length mm

Outside diameter

x Wall thickness

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values ____

Rack travel in mm: 20.0 Testing: 1st rack travel in: 12.00 rpm : 990...1005 Speed 2nd rack travel in: 4.00 rpm : 1065...1095 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.50 LOW IDLE 1 Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm: 5.5 Testing: Speed rpm : 200 Minimum rack trave: 8.00 rpm : 300 Speed Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 Speed rpm : 360...400 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 12.90...13.10 2nd speed rpm : 600 Rack travel in m: 13.30...13.40 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 rpm Pressure hPa : Rack travel mm : 10.40...10.70 Measurement $1/\min : 500$ Speed 1st pressure hPa : 300 Rack travel in m: 11.00...11.10 2nd pressure hPa : 650 Rack travel in m: 12.50...12.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 950 Del.quantity cm3/: 214.0...218.0

1000 s: (211.0...221.0)

cm3 : 8.00

1000 s: (12.0)

Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.00 Speed rpm : 990...1005 STARTING FUEL DELIVERY Speed rom : 100 Del.quantity cm3/: 45.0...75.0 1000 s: (41.0...79.0) Rack travel in mm: 10.40...10.80

Remarks:

E02

Spread

Aneroid pressure h: -

Note remarks

Test sheet : MB

: 11.01.93 Edition Replaces : 11.92 Test oil : ISO-4113

Combination no. : 0 402 648 941

Injection pump

Pump designation: PE8P120A320LS7847 EP type number : 0 412 628 863

Governor

Governor design. : RQV300...950PA1033-7

Governer no. : D 421 814 019

Customer-spec. information

: MERCEDES-BENZ Customer

Engine : 0M402 LA

: 280.0 1st version kW : 1900 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 95...115

Test nozzle holder

assembly : 1 688 901 105

Opening.

: 207...210 pressure, bar

Orifice plate

diameter mm 8.0:

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60 : (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm:600

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 22.8...23.0

100 s: (22.5...23.3)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm : 5.2...5.8

Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.9)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.10...1.50 2nd speed rpm : 567

travel mm

: 4.40...5.00

3rd speed rpm : 780

travel mm : 6.00...6.60

rpm : 10104th speed

travel mm : 8.50...8.70

5th speed rpm : 1190

: 11.00...12.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1050Speed

Rack travel in mm : 10.70...13.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 228.0...230.0

1000 : (225.0...233.0)

: 6.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testing:

1st rack travel in: 12.00

rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1065...1095 Speed

4th rack travel in: 1350

rpm : 0.00...1.50 Speed

LOW IDLE 1 Control Lever

position degrees: 82...90

Testing:

Speed : 200 rpm Minimum rack trave: 9.00

Speed : 300 rom

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

rpm : 300...390 Speed

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

rpm : 600 1st speed

Rack travel in m: 13.40...13.60

2nd speed rpm : 950

Rack travel in m: 12.90...13.10

3rd speed rpm : 850

Rack travel in m: 13.10...13.30

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm

Pressure hPa :

Rack travel mm : 10.40...10.70

Measurement

1/min: 500 Speed

1st pressure hPa : 300

E04

Rack travel in m: 11.00...11.10

2nd pressure hPa : 650

Rack travel in m: 12.50...12.70

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 950 Speed

Del.quantity cm3/: 214.0...218.0

1000 s: (211.0...221.0)

cm3 : 8.00 Spread

1000 s: (12.0) Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

rpm : 990...1000 Speed

STARTING FUEL DELIVERY

Speed L'OW : 100

Del.quantity cm3/: 275.0...295.0

1000 s: (271.0...299.0)

Remarks:

Note remarks

Test sheet

: MB

Edition

: 11.01.93

Replaces

: 08.92

Test oil

: ISO-4113

Combination no. : 0 402 648 942

Injection pump

Pump designation : PE8P120A320LS7847

EP type number

: 0 412 628 863

Governor

Governor design: RQ300/950PA1031-6

: 0 421 801 662 Governer no.

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M402 LA

1st version kW

: 280.0

Rated speed

: 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening 1

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Rack travel in mm: 20.00...21.00

Firing order : 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 600

Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 22.8...23.0

100 s: (22.5...23.3)

Spread

2nd speed

Spread

cm3 : 0.6

100 s: (0.9)

rpm : 300.0

Rack travel in mm : 5.2...5.8

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION

Control-lever position

Dearee: ~2 Speed

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 600

Aneroid pressure h: 1200 Del.quantity

: 228.0...230.0

1000

: (225.0...233.0)

Spread

cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed

rpm

: 600

Rack travel in mm : 20.0 Testing: 1st rack travel in: 12.00 Speed rpm : 990...1005 2nd rack travel in: 4.00 Speed rpm : 1050...1080 4th rack travel in: 1350 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 5.5 Testing: rpm : 200 Speed Minimum rack trave: 8.80 rpm : 300 Speed Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 Speed rpn : 390...430 TORQUE CONTROL Dimension a mm : 0.35Torque control curve - 1st version 1st speed rpm : 950 Rack travel in m: 13.00...13.10 2nd speed rpm : 600 Rack travel in m: 13.30...13.40 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : -Rack travel mm : 10.40...10.70 Measurement Speed 1/min: 500 1st pressure hPa : 300 Rack travel in m: 11.00...11.10 2nd pressure hPa : 650 Rack travel in m: 12.50...12.70 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 950 Speed Del.quantity cm3/: 214.0...218.0 1000 s: (211.0...221.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 990...1005

Remarks:

E06

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 11.01.93 : 10.92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 945 Injection pump Pump designation : PE8P120A320LS7847 EP type number : 0 412 628 863 Governor Governor design. : RQ300/1050PA1030-6 : 0 421 801 666 Governer no. Customer-spec, information Customer : MERCEDES-BENZ Engine : 0M402 LA : 280.0 1st version kW Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 105 assembly Opening pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke nm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

Phasina : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 22.5...22.7

100 s: (22.2...23.0)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.9...5.5 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

cm3 : 0.6 100 s: (1.0) Spread

GUIDE SLEEVE POSITION Control-lever position Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550 Aneroid pressure h: 1200

: 225.0...227.0 Del.quantity 1000 : (222.0...230.0)

Spread Cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed : 600 rpm

Rack travel in mm : 20.0 Testing: 1st rack travel in: 11.60 rpm : 1090...1105 Speed 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.40LOW IDLE 1 Setting point w/out bumper spring rpm : 300° Rack travel in mm: 5.2 Testing: Speed : 200 rpm Minimum rack trave: 7.30 : 300 Speed rpm Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00 Speed : 355...395 rpm TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm: 550
Rack travel in m: 13.00...13.10 rpm : 1050 2nd speed Rack travel in m: 12.60...12.80 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed ron hPa : -Pressure : 9.90...10.20 Rack travel mm Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 10.70...10.80 2nd pressure hPa : 650 Rack travel in m: 12.20...12.40 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 150 Speed Del.quantity cm3/: 210.0...214.0 1000 s: (207.0...217.0) Spread cm3: 8.00 1000 s: (12.0) Aneroid pressure h: -

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.60 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Remarks:

E08

Note remarks

Test sheet

: MB

Edition

: 11.01.93

Replaces

: 11.92

Test oil

: ISO-4113

Combination no. : 0 402 648 946

Injection pump

Pumo designation : PE8P120A320LS7847

EP type number

: 0 412 628 863

Governor

Governor design. : RQ300/1050PA1031-7

: 0 421 801 667 Governer no.

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: OM4G2 LA

1st version kW

: 280.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Openina

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm : 550

Rack travel in mm : 13.00...13.10

Del.quantity cm3/: 22.5...22.7

100 s: (22.2...23.0)

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

Spread

cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 550

Aneroid pressure h: 1200

: 225.0...227.0 Del.quantity

1000 : (222.0...230.0)

: 6.00 cm3

Spread

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed

rom

: 600

Rack travel in mm: 20.0 Testina: 1st rack travel in: 11.70 Speed rpm : 1090...1105 2nd rack travel in: 4.00 Speed rpm : 1175...1205 4th rack travel in: 1300 rpm : 0.00...1.40Speed LOW TDLF 1 Setting point w/out bumper spring Speed rpm: 300 Rack travel in mm: 5.2 Testina: : 200 Speed rpm Minimum rack trave: 7.40 : 300 Speed rpm Rack travel in mm : 5.10...5.30 Rack travel in mm: 2.00 rpm : 365...405 Speed TORQUE CONTROL Dimension a mm : 0.30 Torque control curve - 1st version 1st speed rpm : 550 Rack travel in m: 13.00...13.10 rpm : 1050 2nd speed Rack travel in m: 12.60...12.80 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rpm Pressure hPa : -Rack travel mm : 9.90...10.20 Measurement 1/min: 500 Speed 1st pressure hPa : 300 Rack travel in m: 10.70...10.80 2nd pressure hPa : 650 Rack travel in m: 12.20...12.40 START CUT-OUT

1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1050

Del.quantity cm3/: 210.0...214.0 1000 s: (207.0...217.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 131.0...133.0 1000 s: (128.0...136.0) Spread cm3 : 8.001000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 11.70

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 275.0...295.0 1000 s: (271.0...299.0)

rpm : 1090...1105

Remarks:

Speed

APPLICATION

Omnibus

Note remarks

Test sheet : MB

: 21.01.93 Edition Replaces : 11.92 Test oil : ISO-4113

Combination no. : 0 402 648 950

Injection pump

Pump designation : PE8P120A320LS7860 EP type number : 0 412 628 870

Governor

Governor design. : RQV350.,.1050PA1052

Governer no. : 0 421 814 037

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M402 LA

: 280.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Overflow

quantity min. 1/h: 90...110

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60 : (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 12.90...13.00

Del.quantity cm3/: 23.3...23.5

100 s: (23.0...23.8)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 4.1...4.7 Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.00...1.50 travel mm

rpm : 403 2nd speed

: 1.70...2.20 travel mm

: 453 3rd speed rpm

travel mm : 2.30...2.80

4th speed : 770 rpm

travel mm : 4.70...5.20

: 1108 5th speed rpm

travel mm : 9.40...9.90

GUIDE SLEEVE POSITION Control-lever position

. Degree: -1

rpm : 1185 Speed

Rack travel in mm : 10.00...12.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version rpm : 700 Aneroid pressure h: 1200 Del.quantity : 233.0...235.0 1000 : (230.0...238.0) : 6.00 Spread cm31000 : (9.00) RATED SPEED 1st version Control lever position degrees: 99...107 Testing: 1st rack travel in: 11.30 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1145...1175 4th rack travel in: 1350 Speed rpm : 0.00...1.50LOW IDLE 1 Control lever position degrees: 65...73 Testing: Speed rpm : 250 Minimum rack trave: 8.00 : 350 rpm Rack travel in mm: 4.30...4.50 CONSTANT REGULATION rpm : 380...450 Speed TORQUE CONTROL Dimension a mm : 0.70 Torque control curve - 1st version 1st speed rpm : 700 Rack travel in m: 12.90...13.00 ad speed rpm : 1050 2nd speed Rack travel in m: 12.20...12.40 3rd speed rpm : 900 Rack travel in m: 12.60...12.80 Aneroid/Altitude Compensator Test 1st version Setting : 500 Speed rom hPa : Pressure : 9.80...10.10 Rack travel mm

Rack travel in m: 10.40...10.50 2nd pressure hPa : 750 Rack travel in m: 12.10...12.30 START CUT-CUT Speed 1/min: 270 (280) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1050 Del.quantity cm3/: 206.0...210.0 1000 s: (203.0...213.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: 1200 rpm : 1050 Speed Del.quantity cm3/ : 154.0...158.0 * 1000 s: (151.0...161.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 134.0...136.0 1000 s: (131.0...139.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.30 Speed rpm : 1090...1100 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0) Remarks: * = Set at reduced-delivery stop.

Speed

Measurement

1/min: 500

1st pressure hPa : 350

Note remarks

Test sheet : M3

Edition : 18.12.92 Replaces : 11.92

Test oil : ISO-4113

Combination no. : 0 402 648 953

Injection pump

Pump designation : PE8P12OA32OLS7859

EP type number : 0 412 628 869

Governor

Governor design. : RQV300...950PA1033

-10

Governer no. : 0 421 814 040

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kw : 320.0 Rated speed : 1900

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening.

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

4- 1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 550

Rack travel in mm : 13.60...13.70

Del.quantity cm3/: 24.1...24.3

100 s: (23.8...24.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 4.9...5.5

Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5)

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

Spread

1st speed rpm : 300

travel mm : 1.00...1.50

2nd speed rpm : 567

travel mm : 4.40...4.90

3rd speed rpm : 617

travel mm : 5.00...5.50

4th speed rpm : 780

travel mm : 6.10...6.60

5th speed rpm: 1009

travel mm : 8.30...8.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 11.30...13.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rom : 550Speed Aneroid pressure h: 1000

Del.quantity : 241.0...243.0

1000 : (238.0...246.0)

خ

Spread : 6.00 cm31000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 117...125

Testina:

1st rack travel in: 12.60

rpm : 990...1000 Speed

2nd rack travel in: 4.00

rpm : 1065...1095 Speed

4th rack travel in: 1200

rpm : 0.00...1.50 Speed

LOW IDLE 1 Control lever

position degrees: 82...90

Testing:

Speed rpm : 200 Minimum rack trave: 8.00 : 3CO וווסיו

Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00

rpm : 380...420 Speed

CONSTANT REGULATION

Speed : 300...400 rpm

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom hPa : -Pressure

Rack travel mm : 9.40...9.70

Measurement

Speed $1/\min : 500$

1st pressure hPa : 250

Rack travel in m: 10.30...10.40

2nd pressure hPa : 550

Pack travel in m: 12.30...12.50

START CUT-OUT

1/min : 220 (240) Speed

E14

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 : 950 Speed rpm

Del.quantity cm3/: 230.0...234.0 1000 s: (227.0...237.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

Speed rpm : 990.. 1000

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/ : 260.0...280.0

1000 s: (256.0...284.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 18,12,92 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 955 Injection pump Pump designation: PE8P120A320LS7859 EP type number : 0 412 628 869 Governor Governor design. : RQ300/950PA1031-9 : 0 421 801 675 Governer no. Customer-spec. information Customer : MERCEDES-BENZ : 0M442 LA Engine 1st version kW : 320.0 Rated speed : 1900 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 105 Openina pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: (5.15...5.35) Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-Firing order : 0-45-90-135-180-225-Phasing 270-315 Tolerance + - ° : 0.50 (0.75)Time to cyl. no. : 8 BASIC SETTING rpm: 550 1st speed Rack travel in mm : 13.60...13.70 Del.quantity cm3/: 24.1...24.3 100 s: (23.8...24.6) Spread cm3 : 0.6100 s: (0.9) rpm : 300.02nd speed Rack travel in mm: 4.9...5.5 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.6Spread 100 s: (1.0) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 550 Aneroid pressure h: 1000 Del.quantity : 241.0...243.0 1000 : (238.0...246.0) cm3 : 6.00 1000 : (9.00) Spread RATED SPEED 1st version Setting point: Speed : 600 Rack travel in mm : 20.0 Testing:

: 5.20...5.30

Prestroke mm

1st rack travel in: 12.60 rpm : 990...1005 Speed 2nd rack travel in: 4.00 rpm : 1060...1090 Speed 4th rack travel in: 1200 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rom : 300 Speed Rack travel in mm: 5.2 Testing: : 200 Speed rpm Minimum rack trave: 7.50 rpm : 300 Speed Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00 Speed rpm : 370...410 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 COM Pressure hPa : -: 9.40...9.70 Rack travel mm Measurement $1/\min : 500$ Speed

1st pressure hPa : 250

Rack travel in m: 10.30...10.40

2nd pressure hPa : 550

Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 950 Del.quantity cm3/ : 230.0...234.0

1000 s: (227.0...237.0)

Spread cm3 : 8.001000 s: (12.0)

Aneroid pressure h: -

rpm : 500

Del.quantity cm3/: 132.0...134.0

1000 s: (129.0...137.0)

cm3 : 8.00Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.60

rpm : 990...1005 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 65.0...95.0

1000 s: (61.0...99.0)

Rack travel in mm : 9.40...9.80

Remarks:

E16

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN 18,2 h1 Edition : 18.12.92 Replaces : 06.91 Test oil : ISO-4113 Combination no. : 0 402 649 813 Injection pump Pump designation : PE10P120A520LS7825-1 EP type number : 0 412 629 809 Governor Governor design: RQV250...1150PA902-3 : 0 421 813 761 Governer no. Customer-spec. information Customer : MAN Engine : D 2840 LXE 1st version kW : 603.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzie holder : 1 688 901 019 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 075 Outside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values

: 4.50...4.60 : (4.45...4.65) Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 10- 9- 4- 1- 8- 7-6-3-5-2 : 0-45-72-117-144-189-216-261-288-333 : 0.50 (0.75) Phasing Tolerance + - ° Time to cyl. no. : 10 BASIC SETTING 1st speed rpm: 1150 Rack travel in mm : 13.30...13.40 Del.quantity cm3/: 29.4...29.6 100 s: (29.1...29.9) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 500 Rack travel in mm: 8.8...9.0 Del.quantity cm3/: 14.9...15.1 100 s: (14.6...15.4) cm3 : 0.8 Spread 100 s: (1.2) rpm : 250 3rd speed Rack travel in mm : 7.30...7.50 Del.quantity cm3/: 5.2...6.0 ** 100 s: (-) Spread cm3 : -100 s: (-) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 250 : 0.90...1.10 travel mm 2nd speed rpm : 450 : 2.90...3.50 travel mm 3rd speed : 750 rpm : 5.50...5.90 travel mm 1150 4th speed rpm travel mm : 9.20...9.40 5th speed : 1400 rom : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1280

Speed

per values

BEGINNING OF DELIVERY

Insp. values in parentheses

Set equal delivery quant.

Speed Rack travel in mm : 11.00...13.60 1/min: 200 (220) FULL LOAD DELIV. AT FULL LOAD STOP FUEL DELIVERY CHARACTERISTICS 1st version rpm : 1150 Speed 1st version Aneroid pressure h: 1300 Aneroid pressure h: -: 294.0...296.0 Deliquantity rpm : 500 Speed 1000 : (291.0...299.0) Del.quantity cm3/: 149.0...151.0 : 5.00 Spread cm3 1000 s: (146.0...154.0) 1000 : (9.00)cm3 : 8.00 Spread 1000 s: (12.0) RATED SPEED 1st version **BREAKAWAY** Control lever position degrees: 118...126 1st version 1mm rack travel less than Testing: 1st rack travel in: 12.30 full load rack tr: 12.30 rpm : 1190...1200 Speed Speed rpm : 1190...1200 2nd rack travel in: 4.00 Speed rpm : 1285...1315 STARTING FUEL DELIVERY 4th rack travel in: 1450 rpm : 0.00...1.00Speed Speed ripra : 100 LOW IDLE 1 Del.quantity cm3/: 100.0...120.0** 1000 s: (-) Control lever position degrees: 76...84 Speed rpm : 100 Del.quantity cm3/: 0 * 1000 s: (-) Testing: Speed rpm : 100 Rack travel in mm: 17.5...21.0 Minimum rack trave: 8.90 Speed rpm : 250
Rack travel in mm : 7.30...7.50
Rack travel in mm : 2.00 HIGH IDLE Sceed rpm : 430...490 1st version rpm : 500 Speed Aneroid/Altitude Rack travel in mm : 0.00...7.00 Del.quantity cm3/: 0 * 1000 s: (-)Compensator Test 1st version 2nd version Sett inq Speed rpm : 500 rpm : 500 hPa : 1300 rpm Speed Rack travel in mm : 0.00...7.50 Pressure Del.quantity cm3/: < 50.0 : 13.30...13.40 Rack travel mm 1000 s: (-) Measurement 3rd version $1/\min : 500$ Speed Speed rpm : 500 Rack travel in mm : 8.10...8.30 Del.quantity cm3/: 125.0... 1000 s: (-) 1st pressure hPa : -Rack travel in m: 8.80...9.00 2nd pressure hPa : 100
Rack travel in m: 9.30...9.40
3rd pressure hPa : 470 LOW IDLE Rack travel in m: 12.00...12.40 rpm : 250 Rack travel in mm : 7.30...7.50 START CUT-OUT Del.quantity cm3/ : 52.0...60.0 ** 1000 s: (-)

Remarks:

: MAN-NR. 3-7151

* applies to cylinders 1, 2, 3, 7 and 9
** applies for cylinders 4, 5, 6, 8 and 10

APPLICATION

Ship

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MAN Edition : 18.12.92 Replaces : 07.92 Test oil : ISO-4113 Combination no. : 0 402 649 814 Injection pump Pump designation : PE10P120A520LS7831 EP type number : 0 412 629 806 Governor Governor design: RQ300/950PA950-1 Governer no. : 0 421 801 651 Customer-spec, information Customer : MAN Engine : D 2840 LF 06 1st version kW : 368.0 : 1900 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 019 Open ina pressure, bar : 207...210 Orifice plate diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.00...5.10 : (4.95...5.15) Rack travel in mm : 13.00...14.00 : 10- 9- 4- 1- 8- 7-Firing order 6-3-5-2

Phasing : 0-45-72-117-144-189-216-261-288-333

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

BASIC SETTING

1st speed rpm: 950 Rack travel in mm : 13.30...13.40

Del.quantity cm3/: 22.3...22.5

100 s: (22.0...22.8)

Spread cm3 : 0.5

190 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.9...5.3 Del.quantity cm3/: 1.4...2.0100 s: (1.1...2.3)

Spread cm3 : 0.8100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950 Ameroid pressure h: 1000

Del.quantity : 223.0...225.0 1000 : (220.0...228.0)

Spread : 5.00 cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

rpm : 600 Rack travel in mm: 20.0

Testing:

1st rack travel in: 12.30 rpm : 995...1010 Speed 2nd rack travel in: 4.00 rpm : 1040...1070 Speed 4th rack travel in: 1150

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 5.1

Testing:

Speed rpm : 200 Minimum rack trave: 6.60 rpm : 300

Rack travel in mm : 5.00...5.20 Rack travel in mm : 2.00

: 360...400 Speed rom

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

rpm : 950 1st speed

Rack travel in m: 13.30...13.40

2nd speed rpm : 600

Rack travel in m: 13.30...13.50

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rom hPa : 1000 Pressure

: 13.30...13.40 Rack travel mm

Measurement

Speed $1/\min : 500$

1st pressure hPa : -

Rack travel in m: 10.10...10.30

2nd pressure hPa : 430

Rack travel in m: 10.50...10.60

3rd pressure hPa : 700

Rack travel in m: 12.00...12.40

START CUT-OUT

1/min : 240 (260) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 rpm : 600

Del.quantity cm3/: 219.0...225.0

1000 s: (216.0...228.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 146.0...148.0

1000 s: (143.0...151.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.30

rpm : 995...1010 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 170.0...190.0

1000 s: (166.0...194.0)

LOW IDLE

rpm : 300 Speed

Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 14.0...20.0 1000 s: (11.0...23.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MAN-NR. 3-7222

Setting and blocking of pointer of start-of-delivery sensor on cyl. 10

start of delivery

APPLICATION

Ship

Note remarks

Test sheet

: 18.12.92 Edition : 10.92 Replaces Test oil : ISO-4113

Combination no. : 0 402 678 821

Injection pump

Pump designation : PE8P12DA320LS7860-1

: MB

EP type number : 0 412 628 871

Governor

: RSV350...1050POA535 Governor design.

-11

Governer no. : 0 421 833 391

Customer-spec. information

Customer : MFRCEDES-BFN7

Engine : OM 402 LA

1st version kw : 280.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00X2.50X1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.80...12.90

Del.quantity cm3/: 20.6...20.8

100 s: (20.3...21.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 4.7...5.3 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.9)

cm3 : 0.8Spread

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x :?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1030Speed Aneroid pressure h: 1200

Del.quantity : 206.0...208.0

1000 : (203.0...211.0)

: 6.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version Control lever position degrees: 95...103 Testing: 1st rack travel in: 11.90 Speed rpm : 1070...1080 2nd rack travel in: 4.00 rpm : 1150...1168 Speed 4th rack travel in: 1300 rpm : 0.30...1.40Speed LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 5.0 Testina: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 350 Rack travel in mm : 4.90...5.10 Rack travel in mm : 2.00 Speed rpm : 375...435 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1030 Rack travel in m: 12.80...12.90 nd speed rpm : 700 Rack travel in m: 13.40...13.60 2nd speed rpm : 900 3rd speed Rack travel in m: 13.20...13.40 Aneroid/Altitude Compensator Test 1st version Setting rpm : 500 Speed Pressure hPa : -Rack travel mm : 10.50...10.80 Measurement $1/\min : 500$ Speed 1st pressure hPa : 350 Rack travel in m: 11.20...11.30 2nd pressure hPa : 750 Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.90 Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

Observe VDT-I-420/120

Note remarks

Test sheet

: MB

Edition Replaces : 18.12.92

Test oil

: 10.92 : ISO-4113

Combination no.

: 0 402 678 822

Injection pump

Pump designation : PE8P120A320LS7840-2

EP type number

: 0 412 628 873

Governor

Governor design.

: RSV350...1050P0A535

-10

Governer no.

: 0 421 833 395

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: OM 442 A

1st version kW

: 250.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 8- 7- 2- 6- 3- 5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm : 1030

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 19.3...19.5

cm3 : 0.6

100 s: (19.0...19.8)

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.7

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

Spread

Spread

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Del.quantity

Speed

rpm : 1030

Aneroid pressure h: 1200

: 193.0...195.0

1000 cm3

: (190.0...198.0)

: 6.00

1000 : (9.00)

RATED SPEED

Spread

E24

1st version Control lever position degrees: 95...103 Testing: 1st rack travel in: 11.70 Speed rpm: 1070...1080 2nd rack travel in: 4.00 rpm : 1150...1168 Speed 4th rack travel in: 1300 Speed rpm : 0.30...1.40 LOW IDLE 1 Control lever position degrees: 72...80 Setting point w/out bumper spring Speed rpm : 350 Rack travel in mm: 5.4 Testing: Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm: 350
Rack travel in mm: 5.30...5.50
Rack travel in mm: 2.00
Speed rpm: 385...445 SET IDLE AUXILIARY SPRING Rack travel in mm : 2.00 TORGIUE CONTROL Torque control curve - 1st version 1st speed rpm : 1030 Rack travel in m: 12.60...12.70 2nd speed rpm : 700 Rack travel in m: 12.80...13.00 3rd speed rpm : 900 Rack travel in m: 13.10...13.30 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 500

hPa : -Pressure Rack travel mm : 10.90...11.20 Measurement

 $1/\min : 500$ 1st pressure hPa : 350 Rack travel in m: 11.30...11.40 2nd pressure hPa : 700

Rack travel in m: 12.50...12.70

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1200 Speed rpm : 700 Del.quantity cm3/ : 208.0...212.0 1000 s: (205.0...215.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 136.0...138.0 1000 s: (133.0...141.0) Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.70 Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0)

Remarks:

Observe VDT-1-420/120

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MAN Test sheet Edition : 18.12.92 Replaces : 07.92 : ISO-4113 Test oil Combination no. : 0 402 735 805 Injection pump Pump designation : PES5P120A720/3LS7250 EP type number : 0 412 725 809 Governor Governor design.: RQV325...1000PA962-6 : 0 421 815 301 Governer no. Customer-spec, information Customer Engine : 02865LF06/LU06 : 235.0 1st version kW : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp, "C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Openina : 207...210 pressure, bar Orifice plate diameter mm 8.0: Test lines : 1 680 750 089 Outside diameter x Wall thickness x Length mm : 8.00x2.50x600 (A) Injection pump setting values

Insp. values in parentheses

Set equal delivery quant.

per values

Test pressure, bar: 25...27

BEGINNING OF DELIVERY

: 4.80...4.90 Prestroke mm : (4.75,..4.95) Rack travel in mm : 15.00...16.00 Firing order : 1- 3- 5- 4- 2 Phasing : 0-72-144-216-288 Tolerance $+ - ^{\circ} : 0.50 (0.75)$ Time to cyl. no. : 5 BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 4.40...4.60 & maximum rack tra: 15.0...16.0 Difference ° CS : 1.75...3.25 BASIC SETTING 1st speed rpm : 900 Rack travel in mm : 12.40...12.50 Del.quantity cm3/: 26.0...26.2 100 s: (25.7...26.5) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 350.0Rack travel in mm: 4.8...5.2 Del.quantity cm3/: 4.7...5.3 100 s: (4.4...5.6) Spread cm3 : 1.0100 s: (1.4) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1050: 8.70...8.90 travel mm 2nd speed rpm : 325 travel mm : 2.40...2.60 3rd speed rpm : 520 : 4.20...4.80 travel mm : 810 4th speed man : 6.00...6.40 travel mm : 1350 5th speed rpm : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1180 Speed

Rack travel in mm : 9.20...13.20 Measurement FULL LOAD DELIV. AT FULL LOAD STOP 1/min : 900 Speed 1st version 1st pressure hPa : -Speed rpm : 900Rack travel in m: 8.30...8.50 2nd pressure hPa : 170 Rack travel in m: 8.70...8.80 Aneroid pressure h: 1200 Del.quantity : 200.0...265.0) 3rd pressure hPa : 600 cm3 : 5.00 1000 : (9.00) Spread Rack travel in m: 11.30...11.60 START CUT-OUT RATED SPEED 1/min : 290 (310) Speed 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 288...296 Testina: 1st version 1st rack travel in: 11.20 Aneroid pressure h: 1200 rpm : 1040...1050 Speed Speed rpm : 10002nd rack travel in: 4.00 Del.quantity cm3/: 243.0...249.0 rpm : 1125...1155 1000 s: (240.0...252.0) Speed 4th rack travel in: 1250 Aneroid pressure h: 1200 Speed rpm : 0.00...1.00Speed man : 650 Del.quantity cm3/: 270.0...276.0 1000 s: (267.0...279.0) LOW IDLE 1 Control lever Aneroid pressure h: position degrees: 242...250 Speed rpm : 500 Del.guantity cm3/: 159.0...161.0 Testina: 1000 s: (156.0...164.0) Speed : 250 COM Minimum rack trave: 6.50 Speed : 350 CDM BREAKAWAY Rack travel in mm : 4.90...5.10 1st version CONSTANT REGULATION 1mm rack travel less than Speed rpm : 340...450 full load rack tr: 11.20 TORQUE CONTROL Speed rpm : 1040...1050 Dimension a mm :? Torque control curve - 1st version STARTING FUEL DELIVERY rpm : 900 1st speed Rack travel in m: 12.40...12.50 rpm : 1000 2nd speed Speed rpm : 100 Del.quantity cm3/: 180.0...200.0 Rack travel in m: 12.10...12.30 rpm : 650 3rd speed 1000 s: (176.0...204.0) Rack travel in m: 12.00...12.20 4th speed rpm : 400 LOW IDLE Rack travel in m: 11.10...11.40 Speed rpm : 350Aneroid/Altitude Rack travel in mm : 4.80...5.20 Compensator Test Del.quantity cm3/ : 47.0...53.0 1000 s: (44.0...56.0) cm3 : 10.00 Spread 1st version 1000 s: (14.00) Setting Speed : 900 rpm Remarks: hPa : 1200 Pressure : MAN-NR. 3-7202

Rack travel mm

: 12.40...12.50

Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 start of delivery

Note remarks

Test sheet : MAN 10,0 f Edition : 18.12.92 Replaces : 07.92 Test oil : ISO-4113

: 0 402 735 806 Combination no.

Injection pump

Pump designation : PES5P120A720/3LS7250

EP type number : 0 412 725 809

Governor

Governor design. : RQV325...1000PA960

-8K

: 0 421 815 308 Governer no.

Customer-spec. information Customer : MAN

Engine : D2865LF03

1st version kW : 235.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter x Wall thickness

: 8,00x2,50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.80...4.90 : (4.75...4.95) Rack travel in mm : 15.00...16.00

Firing order : 1-3-5-4-

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed rom: 650

Rack travel in mm : 11.80...11.90

Det.quantity cm3/: 26.6...26.8

100 s: (26.3...27.1)

cm3 : 0.5Spread

100 s: (0.9)

rpm : 325.02nd speed Rack travel in mm: 4.8...5.2

Del.quantity cm3/: 4.7...5.3 100 s: (4.4...5.6)

cm3 : 0.8 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

Spread

1st speed rpm : 1055

: 10.40...10.60 travel mm

2nd speed 325 rpm :

: 2.40...2.60 travel mm

rpm : 500 3rd speed

travel mm : 3.40...4.00

4th speed rpm : 750

: 6.80...7.20 travel mm

5th speed rpm : 1350

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1130 Speed

Rack travel in mm : 9.10...13.10

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 650

F01

Aneroid pressure h: 1200 : 266.0...268.0 Del.quantity 1000 : (263.0...271.0) Spread cm3 : 5.00 1000 : (9.00)RATED SPEED 1st version Control lever position degrees: 293...301 Testing: 1st rack travel in: 11.10 rpm : 1040...1050 Speed 2nd rack travel in: 4.00 rpm : 1125...1155 Speed 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 248...256 Testing: Speed man : 225 Minimum rack trave: 6.50 rpm : 325 Rack travel in mm : 4.90...5.10 CONSTANT REGULATION rpm : 340...450 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 650 Rack travel in m: 11.80...11.90 2nd speed rpm : 1000 Rack travel in m: 12.00...12.20 3rd speed rpm : 900 Rack travel in m: 12.30...12.50 Anaroid/Altitude Compensator Test 1st version Setting Speed rpm: : 900 Pressure hPa : 1200 : 12.30...12.50 Rack travel mm Measurement 1/min: 900 Speed 1st pressure hPa : -Rack travel in m: 8.20...8.40 2nd pressure hPa : 170

Rack travel in m: 8.60...8.70

3rd pressure hPa : 600 Rack travel in m: 11.30...11.60 START CUT-OUT 1/min : 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 1000 Del.quantity cm3/: 245.0...251.0 1000 s: (242.0...254.0) Aneroid pressure h: 1200 Speed rpm : 900 Del.quantity cm3/ : 260.0...266.0 1000 s: (257.0...269.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 159.0...161.0 1000 s: (156.0...164.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.10 Speed rpm : 1040...1050 STARTING FUEL DELIVERY rpm : 100 Speed Del.quantity cm3/: 180.0...200.0 1000 s: (176.0...204.0) LOW IDLE Speed rpm : 325 Rack travel in mm : 4.80...5.20 Del.quantity cm3/: 47.0...53.0 1000 s: (44.0...56.0) Spread cm3 : 8.001000 s: (12.00) Remarks: : MAN-NR. 3-7201 Setting and blocking of pointer of start-of-delivery sensor on cyl. 5 start of delivery

Note remarks

Test sheet : CUM 5,9 w : 11.01.93 Edition Replaces : 05.92 : ISO-4113 Test oil

Combination no. : 0 402 736 806

Injection pump

Pump designation : PES6P110A120RS7213

EP type number : 0 412 716 804

Governor

Governor design. : RQV400...1250PA964K

: 0 421 815 252 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 68TA-A

1st version kW : 171.5 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

assembly : 1 688 901 101

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45

: (4.30...4.50)

Rack travel in mm : 9.00...12.00

: 1-5-3-6-2-4 Firing order

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rom : 1250

Rack travel in mm : 15.80...15.90

Del.quantity cm3/: 16.8...17.0

100 s: (16.5...17.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rom : 400.0Rack travel in mm: 5.7...5.9 Del.quantity cm3/: 3.2...3.8 100 s: (3.0...4.0)

cm3 : 0.8 Spread

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 400

travel mm : 1.60...1.80

2nd speed rpm : 600

travel mm : 2.80...3.30

3rd speed : 1300 rpm

: 7.20...7.40 travel mm

4th speed : 1500 rpm

travel mm : 8.90...9.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 1500

Del.quantity : 168.5...170.5

1000 : (165.5...173.5)

: 5.00 Spread cm3

1000 : (9.00) RATED SPEED

1st version Control lever

position degrees: 59...67

Testing:

1st rack travel in: 14.80

rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1475...1505

4th rack travel in: 1600

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 13...21

Testing:

Speed : 275 rpm

Minimum rack trave: 7.20

rom : 400

Rack travel in mm : 5.70...5.90

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1250

Rack travel in m: 15.80...15.90

2nd speed rpm : 825

Rack travel in m: 14.70...14.90

3rd speed rpm : 700

Rack travel in m: 14.00...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 1250 rom hPa : 1500 Pressure

Rack travel mm : 15.80...15.90

Measurement

Speed 1/min: 1250

1st pressure hPa : -

Rack travel in m: 8.10...8.50

2nd pressure hPa : 400

Rack travel in m: 10.20...10.30

3rd pressure hPa : 930

Rack travel in m: 13.80...14.20

START CUT-OUT

Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

rpm : 825

Del.quantity cm3/: 178.0...184.0 1000 s: (175.0...187.0)

cm3 : 8.00Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 87.0...91.0

1000 s: (85.0...93.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.80

Speed rpm : 1290...1300

STARTING FUEL DELIVERY

: 100 rpm

Del.quantity cm3/: 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 12.40...13.40

LOW IDLE

Speed rpm : 400

Rack travel in mm : 5.70...5.90

Del.quantity cm3/: 32.0...38.0

1000 s: (30.0...40.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: C.D.C. # 3921769

Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

1/min: 300 (310)

F04

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : CUM 8,3 r 2 : 08.12.92 Edition Replaces : 10.92 Test oil : ISO-4113

Combination no. : 9 402 736 816

Injection pump

Pump designation : PES6P110A120RS7214 EP type number : 0 412 716 805

Governor

Governor design. : RQV350...1200PA964

-8K

Governer no. : 0 421 815 264

Customer-spec. information Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 213.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45 : (4.30...4.50)

Rack travel in mm ; 9.00...12.00

Firing order : 1-5- 3-6-2-4

Phasina : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 14.70...14.80

Del.quantity cm3/: 19.1...19.3

100 s: (18.8...19.6)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 350.02nd speed Rack travel in mn: 5.6...5.8 Del.quantity cm3/ : 2.7...3.3

100 s: (2.5...3.5) cm3 : 0.8

Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

travel mm : 1.80...2.00

: 450 2nd speed rom

3.10...3.50 travel mm

3rd speed rpm : 700

travel mm : 5.90...6.30

4th speed rpm : 1200

: 9.00...9.20 travel mm

5th speed rpm : 1400

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Spread

cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 62...70

Testing:

1st rack travel in: 13.20

rpm : 1245...1255 Speed

2nd rack travel in: 4.00

rpm : 1400...1430 Speed

4th rack travel in: 1500

Speed rom : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

Speed rpm : 275 Minimum rack trave: 7.20 rpm : 350

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

rpm : 325...520 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 14.70...14.80

2nd speed rpm : 650

Rack travel in m: 12.60...13.00

3rd speed rpm : 1200

Rack travel in m: 14.20...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

: 1100 Speed rom Pressure hPa : 1200

Rack travel mm : 14.70...14.80

Measurement

1/min: 1100 Speed

1st pressure hPa : -

Rack travel in m: 7.80...8.20 2nd pressure hPa : 335

Rack travel in m: 9.60...9.70

3rd pressure hPa : 785

Rack travel in m: 12.80...13.20

START CUT-OUT

1/min : 290 (300) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 650 Speed

Del.quantity cm3/: 183.5...189.5

1000 s: (180.5...192.5)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 90.0...94.0

1000 s: (88.0...96.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20

rpn : 1245...1255 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 10.70...11.70

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.60...5.80

Del.quantity cm3/: 27.0...33.0 1000 s: (25.0...35.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: C.D.C. # 3921770

Start-of-delivery mark 6° cam angle

after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : CUM Edition : 05.02.93 Replaces Test oil : ISO-4113 Combination no. : 0 402 736 823 Injection pump Pump designation : PES6P110A12ORS7249 EP type number : 0 412 716 807 Governor Governor design. : RQV350...1150PA964 : 0 421 815 295 Governer no. Customer-spec. information Customer : CDC Engine : 6CTA-A 1st version kW : 187.0 Rated speed : 2300 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 115...125 Test nozzle holder assembly : 1 688 901 101 Opening . pressure, bar : 207...210

Orifice plate diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____

BEGINNING OF DELIVERY Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45 : (4.30...4.50)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1150

Rack travel in mm: 14.30...14.40

Del.quantity cm3/: 17.8...18.0

100 s: (17.5...18.3)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 2.3...2.9 100 s: (2.1...3.1)

Spread cm3 : 0.7100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

travel mm : 1.70...2.10

2nd speed rpm : 450

travel mm : 3.10...3.50

3rd speed rpm : 700

: 5.90...6.30 travel mm

4th speed rpm : 1200

: 9.00...9.20 travel mm rpm : 1400 5th speed

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150Aneroid pressure h: 1200

Del.quantity : 178.0...183.0)

cm3 : 5.00 Spread $1000 \div (9.00)$ RATED SPEED 1st version Control lever position degrees: 61...69 Testina: 1st rack travel in: 13.30 rpm : 1195...1205 2nd rack travel in: 4.00 rpm : 1370...1400 Speed 4th rack travel in: 1500 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 11...19 Testing: Speed rpm : 275 Minimum rack trave: 7.10 rpm : 350 Speed Rack travel in mm : 5.40...5.60 CONSTANT REGULATION Speed rpm : 350...500 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 14.30...14.40 2nd speed rpm : 650 Rack travel in m: 11.60...12.00 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1150 rpm hPa : 1200 Pressure Rack travel mm : 14.30...14.40 Measurement 1/min: 1150 Speed 1st pressure hPa : -Rack travel in m: 7.90...8.30 2nd pressure hPa : 320 Rack travel in m: 9.60...9.70 3rd pressure hPa : 860 Rack travel in m: 13.20...13.60

1/min: 290 (300) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 650 Speed Del.quantity cm3/: 165.0...171.0 1000 s: (162.0...174.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm: 500
Del.quantity cm3/: 83.5...87.5
1000 s: (81.5...89.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.30 rpm : 1195...1205 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0) Rack travel in mm : 10.90...11.90 LOW IDLE Speed rpm Rack travel in mm : 5.40...5.60 Del.quantity cm3/: 23.5...29.5 1000 s: (21.5...31.5) Spread cm3 : 7.001000 s: (11.00) Remarks: : C.D.C. # 3921970 Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

START CUT-OUT

Note remarks

Test sheet : CUM

Edition : 22.01.93

Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 829

Injection pump

Pump designation : PES6P120A120RS7261

EP type number : 0 412 726 876

Governor

Governor design. : RQV350...1100PA924

-7K

: 0 421 815 317 Governer no.

Customer-spec. information Customer : CUMMINS

Engine : 6CTAA

1st version kW : 202.0

: 2200 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ___

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm

: 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - '

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 12.00...12.10

Del.quantity cm3/: 16.5...16.7

100 s: (16.5...17.3)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 350.0Rack travel in mm: 4.7...4.9

Del.quantity cm3/: 2.3...2.9

100 s: (2.1...3.1) Spread cm3 : 0.7

100 s: (1.1)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

travel mm : 1.10...1.50

rpm : 550 2nd speed

: 3.40...4.00 travel mm

3rd speed rpm : 900

travel mm : 6.10...6.70

rpm : 1150 4th speed

travel mm : 8.40...8.60

rpm : 12505th speed

: 9.40...9.80 travel mm

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1400 Speed

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

rpm : 1100 Speed

Aneroid pressure h: 1200

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 111...119 Testing: 1st rack travel in: 11.00 rpm : 1140...1150 Speed 2nd rack travel in: 4.00 Speed rpm : 1260...1290 4th rack travel in: 1350 rpm : 0.00...1.00 Speed LOW IDLE 1 Control lever position degrees: 66...74 Testing: Speed rpm : 250Minimum rack trave: 6.30 rpm : 350 Rack travel in mm : 4.70...4.90 CONSTANT REGULATION rpm : 350...450 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 12.00...12.10 2nd speed rpm : 700 Rack travel in m: 11.20...11.40 3rd speed rpm : 900 Rack travel in m: 11.40...11.70 4th speed rpm : 500 Rack travel in m: 10.40...10.70 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1100 rpm hPa : 1200 Pressure : 12.00...12.10 Rack travel mm Measurement 1/min: 1100 Speed

Rack travel in m: 11.10...11.20 3rd pressure hPa : 320 Rack travel in m: 8.20...8.40 START CUT-OUT 1/min : 270 (290) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 700 Del.quantity cm3/: 181.0...187.0 1000 s: (178.0...190.0) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 105.0...109.0 1000 s: (103.0...111.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.00 rpm : 1140...1150 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 250.0...280.0 1000 s: (246.0...284.0) LOW IDLE Speed rpm : 350 Rack travel in mm : 4.70...4.90 Del.quantity cm3/: 23.0...29.0 1000 s: (21.0...31.0) Spread cm3 : 7.001000 s: (11.00) Remarks: : C.D.C # 3281842 Start-of-delivery mark is at 7° after

start of delivery.

1st pressure hPa : -

2nd pressure hPa : 700

Rack travel in m: 7.40...7.60

Note remarks

Test sheet : RVI 6,2 h Edition : 18.12.92 : 09.92 Replaces Test oil : ISO-4113

Combination no. : 0 402 746 883

Injection pump

Pump designation : PES6P110A320RS7198

EP type number : 0 412 716 802

Governor

Governor design. : RQV275...1250PA942K

: 0 421 815 234 Governer no.

Customer-spec. information Customer : RVI

Engine : MIDRO6-06-26

: 132.5 1st version kW Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test Lines : 1 680 750 089

Outside diameter x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.53...4.63 : (4.48...4.68)

Rack travel in mm : 12.50...13.50

Firing order : 1-5-3-6-2-4

Fhasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.30 (0.75)$

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.60...14.70

& maximum rack tra: 21.00

Difference ° CS : 2.50...4.00

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 14.60...14.70

Del.quantity cm3/: 15.7...15.9

100 s: (15.4...16.1)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 275.0

Rack travel in mm: 4.9...5.3

Del.quantity cm3/: 1.7...2.2 100 s: (1.4...2.4)

cm3 : 0.4

Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

: 9.50...9.70 travel mm

rpm : 2752nd speed

: 0.90...1.10 travel mm

3rd speed rpm : 550

travel mm : 3.80...4.20

4th speed rpm : 1000

: 7.10...7.50 travel mm

5th speed rpm : 1600

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1385

Rack travel in mm : 12.30...14.90

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 1250 Aneroid pressure h: 1000 Del.quantity : 157.0...159.0 1000 : (154.5...161.5) Spread : 4.00 cm3 1000 : (7.50)RATED SPEED 1st version Control lever position degrees: 110...118 Testing: 1st rack travel in: 13.60 rpm : 1315...1325 Speed 2nd rack travel in: 4.00 rpm : 1475...1505 Speed 4th rack travel in: 1600 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 58...66 Testing: Speed rpm Minimum rack trave: 5.70 Speed : 275 rom Rack travel in mm : 5.00...5.20 CONSTANT REGULATION Speed : 350...480 rpm TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1250 Rack travel in m: 14.60...14.70 2nd speed rpm : 750 Rack travel in m: 13.70...13.90 3rd speed rpm : 300 Rack travel in m: 12.39...13.30 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1250 man Pressure hPa : 1000 : 14.60...14.70 Rack travel mm Measurement 1/min: 1250 Speed 1st pressure hPa : -Rack travel in m: 11.00...11.40

2nd pressure hPa : 360
 Rack travet in m: 12.80...12.90 3rd pressure hPa : 220 Rack travel in m: 11.80...12.20 START CUT-OUT 1/min: 200 (220) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 750
Del.quantity cm3/ : 125.0 ...129.0 1000 s: (122.0...132.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 67.0...69.0 1000 s: (64.5...71.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.60 rpm : 1315...1325 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 85.0...115.0 1000 s: (81.0...119.0) LOW IDLE Speed rpm : 275 Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 17.0...22.0 1000 s: (14.5...24.5) Spread cm3 : 4.50 1000 s: (7.50) Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

Test sheet : RVI 6,2 i Edition : 18.12.92 Replaces : 04.92 Test oil : ISO-4113

Combination no. : 0 402 746 894

Injection pump

Pump designation : PES6P110A320RS7208 : 0 412 716 803

EP type number

Governor

Governor design. : RQV275...1175PA942

-1K

: 0 421 815 244 Governer no.

Customer-spec. information Customer

Engine : MIDRO60226 M

1st version kW : 210.0 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.03...4.13 Prestroke mm

: (3.98...4.18)

Rack travel in mm : 13.00...14.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.30 (0.75)$

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 14.00...14.10

& maximum rack tra: 21.00

Difference ° CS : 2.75...4.25

BASIC SETTING

1st speed rpm: 1175

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 17.0...17.2

100 s: (16.7...17.4)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 275.0 2nd speed

Rack travel in mm : 4.9...5.5 Del.quantity cm3/ : 1.9...2.3

100 s: (1.6...2.5)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

: 9.10...9.20 travel mm

rpm : 275 2nd speed

: 0.90...1.10 travel mm

: 550 3rd speed rpm

: 3.80...4.20 travel mm

: 1000 4th speed rom

: 7.00...7.40 travel mm

5th speed rpm : 1600

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1400 Speed

Rack travel in mm : 11.70...14.30

FULL LOAD DELIV. AT FULL LOAD STOP

rpm : 1175 Aneroid pressure h: 1000 Del.quantity : 170.0...172.0 1000 : (167.5...174.5) Spread cm3 : 4,00 1000 : (7.50) RATED SPEED 1st version Control lever position degrees: 110...118 Testing: 1st rack travel in: 13.00 rpm : 1240...1250 Speed 2nd rack travel in: 4.00 rpm : 1415...1445 Speed 4th rack travel in: 1600 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 56...64 Testing: Speed rpm : 200 Minimum rack trave: 5.80 rpm Rack travel in mm : 5.10...5.30 CONSTANT REGULATION Speed rpm : 350...480 TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version rpm : 1175 1st speed Rack travel in m: 14.00...14.10 rpm : 700 2nd speed Rack travel in m: 13.25...13.45 3rd speed rpm : 800 Rack travel in m: 13.50...13.70 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1175 rpm hPa : 1000 Pressure : 14.00...14.10 Rack travel mm Measurement Speed 1/min: 1175 1st pressure hPa : -F14

1st version

Speed

Rack travel in m: 10.40...11.00 2nd pressure hPa : 520 Rack travel in m: 12.50...12.60 3rd pressure hPa : 240 Rack travel in m: 11.10...11.50 START CUT-OUT 1/min : 200 (220) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 700 Del.quantity cm3/: 148.0...154.0 1000 s: (145.0...157.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 74 0...76.0 1000 s: (71.5...78.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 Speed rpm : 1240...1250 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 90.0...120.0 1000 s: (86.0...124.0) LOW IDLE Speed rpm : 275
Rack travel in mm : -8.50...-9.10
Del.quantity cm3/ : 19.0...23.0
1000 s: (16.5...25.5) Spread cm3 : 4.501000 s: (7.50) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS : 5.20...5.30 Prestroke mm : (5.15...5.35) Note remarks Rack travel in mm : 9.00...12.00 : 1-5-3-6-2-4 Firing order Test sheet : ENA 11,8 L1 Edition : 05.02.93 Replaces : 11,91 : ISO-4113 Test oil Phasing : 0-60-120-180-240-300 Combination no. : 0 402 746 898 Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6P120A320RS7215 EP type number : 0 412 726 838 BASIC SETTING Governor Governor design. : RQV250...1000PA967 1st speed rpm: 600 Governer no. : 0 421 813 876 Rack travel in mm : 13.00...13.10 Customer-spec. information Customer : ENASA Del.quantity cm3/: 28.8...29.0 Engine : 96 R1 FX 100 s: (28.5...29.3) : 294.0 1st version kW Spread cm3 : 0.5: 2000 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 250.0Test oil Rack travel in mm: 5.7...6.1 inlet temp. °C : 38...42 Del.quantity cm3/: 1.0...1.6 100 s: (0.7...1.9) Overflow valve Spread cm3 : 0.8 : 1 417 413 025 100 s: (1.2) Inlet press., bar: 1.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 019 assembly GUIDE SLEEVE TRAVEL 1st speed rpm : 250 Opening : 1.00...1.40 travel mm pressure, bar : 207...210 rpm : 350 2nd speed : 2.10...2.60 travel mm Orifice plate 3rd speed : 700 rpm : 4.70...5.30 diameter mm : 0,8 travel mm 4th speed : 1055 rpm 7.90...8.10 travel mm Test lines : 1 680 750 067 : 1145 5th speed rom : 9.00...9.40 travel mm Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 6.00x1.50x1000 Control-Lever position Degree: -1 (A) Injection pump setting values rpm : 1070Speed Insp. values in parentheses Rack travel in mm : 15.20...17.80 Set equal delivery quant. per values FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version Test pressure, bar: 25...27 Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 288.9...273.0) cm3 : 5.00 Spread 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 116...124 Testing: 1st rack travel in: 12.00 rpm : 1050...1060 Speed 2nd rack travel in: 4.00 nom : 1140...1170 4th rack travel in: 1250 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 73...81 Testing: Speed : 100 mqn Minimum rack trave: 5.00 : 250 rpm Rack travel in mm : 3.30...3.70 CONSTANT REGULATION Speed rpm : 250...320 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 **m**C hPa : 1200 Pressure Rack travel mm : 13.00...13.10 Measurement $1/\min : 500$ Speed 1st pressure hPa : -Rack travel in m: 8.50...8.90 2nd pressure hPa : 710 Rack travel in m: 11.80...11.90 3rd pressure hPa : 350 Rack travel in m: 9.80...10.00 START CUT-OUT Speed 1/min: 170 (190) FUEL DELIVERY CHARACTERISTICS 1st version

Aneroid pressure h: 1200 Speed : 900 rpm Del.auantity cm3/ : 279.0...283.0 1000 s: (276.0...286.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 146.0...149.0 1000 s: (143.0...152.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.00 Speed rpm : 1050...1060 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 200.0...220.0 1000 s: (196.0...224.0) Rack travel in mm : 19.50...21.00 LOW IDLE Speed rpm : 250 Rack travel in mm : 3.30...3.70 Remarks:

Delivery-valve spring pre-tension 3.2...3.4 mm. Permissible alteration of 3.0...3.5 mm

+

F16

Note remarks

Test sheet : UNI 9,5 i 1 : 21.01.93 Edition Replaces : 06.92 Test oil : ISO-4113

Combination no. : 0 402 746 902

Injection pump

Pump designation : PES6P120A720RS7224 EP type number : 0 412 726 840

Governor

Governor design. : RQV275...1100PA975

: 0 421 815 267 Governer no.

Customer-spec. information Customer : IVECO-UNIC

: 8460.41.320 Engine

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nazzle holder

assembly : 1 688 901 105

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 008

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.10...5.20 Prestroke mm

: (5.05...5.25)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rom : 1100

Rack travel in mm : 11.20...11.30

Del.quantity cm3/: 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0Rack travel in mm : 5.1...5.5 Del.quantity cm3/ : 3.2...3.8

100 s: (2.9...4.1)

Spread cm3 : 0.8100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1145 1st speed

: 10.30...10.50 travel mm

: 275 2nd speed rpm

: 1.30...1.50 travel mm

3rd speed : 450 rpm

: 3.40...4.00 travel mm

4th speed : 750 rpm

: 5.90...6.30 travel mm

5th speed : 1350 mgn

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1140

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 207.0...214.0)

; 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 115...123

Testing:

1st rack travel in: 10.20

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1200...1230 Speed

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 64...72

Testing:

Speed rpm : 100 Minimum rack trave: 6.80 rom : 275

Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

rpm : 270...400 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.20...11.30

2nd speed rpm : 700

Rack travel in m: 9.90...10.10

3rd speed rpm : 900

Rack travel in m: 10.70...10.90

4th speed rpm : 400

Rack travel in m: 9.30...9.70

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 1100 rpm Pressure hPa : 1200

Rack travel mm : 11.20...11.30

Measurement

1/min : 1100Speed

1st pressure hPa : -

Rack travel in m: 7.70...7.90

2nd pressure hPa : 600

Rack travel in m: 10.60...10.70

3rd pressure hPa : 420

Pack travel in m: 9.10...9.50

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

: 700 rpm

Del.quantity cm3/: 188.0...194.0 1000 s: (185.0...197.0)

Aneroid pressure h:

Speed rpm : 500 Del.quantity cm3/: 120.0...122.0 1000 s: (117.0...125.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.20

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 150.0...180.0

1000 s: (146.0...184.0)

LOW IDLE

Speed rpm : 275 Rack travel in mm : 5.10...5.50 Del.quantity cm3/: 32.0...38.0

1000 s: (29.0...41.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet

Edition

: 18.12.92

Replaces

: 10.92

Test oil

: ISO-4113

Combination no.

: 0 402 746 919X

Injection pump

Pump designation : PES6P120A720LS7237

EP type number

: 0 412 726 872

Governor

Governor design. : RQ300/1100PA1013-1

Governer no.

: 0 421 801 603

Cust. part no.

: 0220743402

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M447 hA

1st version kW

: 184.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test Lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ___

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 6-2-4-1-5-3

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no.

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 13.70...13.90

Del.quantity cm3/: 20.3...20.5

100 s: (20.0...20.8)

Spread

cm3 : 0.5

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm: 6.2...6.8

Del.quantity cm3/: 1.6...2.2

Spread

100 s: (1.3...2.5)

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Spread

rpm : 1100

Aneroid pressure h: 1400

Del.quantity

: 203.0...205.0

1000 : (200.0...208.0)

cm3 : 5.00 1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm: 20.0

Testina:

1st rack travel in: 12.80

rpm : 1145...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1220,...1250 4th rack travel in: 1300

rpm : 0.00...1.50 Speed

LOW IDLF 1

Setting point w/out bumper spring

Speed rpm: 300 Rack travel in mm: 6.5

Testing:

Speed rpm : 200 Minimum rack trave: 8.30 rpm : 300

Rack travel in mn: 6.40...6.60

Rack travel in mm: 2.00

Speed rpm : 370...410

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom Pressure hPa : -

: 11.80...12.10 Rack travel mm

Measurement

1/min : 500Speed

1st pressure hPa : 600

Rack travel in m: 12.40...12.50

2nd pressure hPa : 950

Rack travel in m: 13.10...13.30

START CUT-OUT

1/min: 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400 rpm : 800 Speed

Del.quantity cm3/: 205.0...209.0

1000 s: (202.0...212.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity_cm3/ : 144.0...146.0

1000 s: (141.0...149.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 200.0...220.0

1000 s: (196.0...224.0)

Remarks:

F20

Note remarks

Test sheet : RVI 6,2 L : 11.01.93 Edition Replaces : 03.92 Test oil : ISO-4113

Combination no. : 0 402 746 924

Injection pump

Pump designation : PES6P110A320RS7243 EP type number : 0 412 716 806

Governor

Governor design. : RQV275...1250PA942

-2K

: 0 421 815 288 Governer no.

Customer-spec. information Customer : RVI

: MIDRO6-06-26 L/2 **Engine**

1st version kW : 132.5 : 2500 Rated speed

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.85...4.95

: (4.80...5.00)

Rack travel in mm : 13.00...14.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 13.00...0.00

& maximum rack tra: 21.00

Difference ° CS : 1.00...2.25

BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 14.0...14.2

100 s: (13.7...14.4)

cm3 : 0.4Spread

100 s: (0.7)

2nd speed rpm : 275.0 Rack travel in mm: 7.4...7.8

Del.quantity cm3/ : 2.4...2.8 100 s: (2.4...2.8)

Spread cm3 : 0.4100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1320 1st speed

travel mm : 9.70...9.90

2nd speed rpm : 275

travel mm : 0.90...1.10

3rd speed rpm : 600

: 4.20...4.60 travel mm

4th speed : 1000 rpm

: 7.00...7.40 travel mm

rpm : 16005th speed

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 rpm : 1450Speed

Rack travel in mm : 8.80...11.40 Speed $1/\min : 1250$ FULL LOAD DELIV. AT FULL LOAD STOP 1st pressure hPa : -Rack travel in m: 10.10...10.50 1st version 2nd pressure hPa : 280 Rack travel in m: 11.20...11.30 Speed rpm : 1250 Aneroid pressure h: 1000 3rd pressure hPa : 180 Del.quantity : 140.0...142.0 Rack travel in m: 10.60...11.00 1000 : (137.5...144.5) cm3 Spread : 4.00 START CUT-OUT 1000 : (7.50)1/min: 200 (220) Speed RATED SPEED FUEL DELIVERY CHARACTERISTICS 1st version Control lever position degrees: 272...280 1st version Aneroid pressure h: 1000 Testing: Speed rpm : 650 Del.quantity cm3/: 124.5...128.5 1000 s: (124.5...128.5) 1st rack travel in: 12.00 rpm : 1320...1330 Speed 2nd rack travel in: 4.00 Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 79.0...81.0 rpm : 1460...1490 Speed 4th rack travel in: 1600 Speed rpm : 0.00...1.00 1000 s: (76.5...83.5) cm3 : 10.00Spread LOW IDLE 1 1000 s: (14.0) Control lever position degrees: 218,...226 BREAKAWAY Testing: Speed rpm : 200 1st version Minimum rack trave: 6.00 1mm rack travel less than rpm : 275 Rack travel in mm : 5.30...5.50 full load rack tr: 12.00 rpm : 1320...1330 Speed CONSTANT REGULATION rpm # 350...480 Speed STARTING FUEL DELIVERY TORQUE CONTROL Speed rpm : 100 Del.quantity cm3/ : 100.0...130.0 Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1250 Rack travel in m: 13.00...13.10 1000 s: (96.0...134.0) 2nd speed rpm : 650LOW IDLE Rack travel in m: 12.00...12.10 3rd speed rpm : 300 Speed rpm : 275 Rack travel in m: 11,20...11.60 Rack travel in mm : 5.20...5.60 Del.quantity cm3/: 24.0...28.0 Aneroid/Altitude 1000 s: (24.0...28.0) Compensator Test cm3 : 4.50 Spread 1000 s: (7.50) 1st version Remarks: Setting Speed : 1250 rpm Pressure hPa : 1000 Setting and blocking of pointer of Rack travel mm : 13.00...13.10 start-of-delivery sensor on cyl. 1 start of delivery Measurement

Note remarks

Test sheet : RVI 6,2 L 1 Edition : 11.01.93 Replaces : 03.92 Test oil : ISO-4113

Combination no. : 0 402 746 928

Injection pump

Pump designation : PES6P110A32ORS7243 EP type number : 0 412 716 806

Governor

Governor design. : RQV275...1175PA942

: 0 421 815 294 Governer no.

Customer-spec. information Customer : RVI

Engine : MIDRO6-06-26 M/2

1st version kW : 132.5 Rated speed : 2350

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ___

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.85...4.95 Prestroke nm : (4.80...5.00)

Rack travel in mm : 13.00...14.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFFRENCE

betw. rack trav. m: 13.40...13.50

& maximum rack tra: 21.00

Difference * CS : 1.00...2.25

BASIC SETTING

1st speed rpm: 1175

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 15.2...15.4

100 s: (14.9...15.6)

Spread cm3 : 0.4

100 s: (0.7)

rpm : 275.0 2nd speed Rack travel in mm: 4.9...5.3 Del.quantity cm3/: 2.3...2.7

100 s: (2.3...2.7)

cm3 : 0.4Spread 100 s: (0.7)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 1250 1st speed

: 9.10...9.30 travel mm

rpm : 275 2nd speed

: 0.90...1.10 travel mm

3rd speed rpm : 600

: 4.20...4.60 travel mm

rpm : 10004th speed

travel mm : 7.00...7.40

5th speed rpm : 1600

: 13.00...14.00 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed rpm : 1450

Rack travel in mm : 8.80...11.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1175 Aneroid pressure h: 1000 : 152.0...154.0 Del.quantity 1000 : (149.5...156.5) cm3 : 4.00 Spread 1000 : (7.50)RATED SPEED 1st version Control Lever position degrees: 290...298 Testina: 1st rack travel in: 12.40 Speed rpm : 1255...1265 2nd rack travel in: 4.00 rpm : 1425...1455 Speed 4th rack travel in: 1550 Speed rpm : 0.00...1.00LOW IDLE 1 Control Lever position degrees: 238...246 Testina: Speed : 200 rpm Minimum rack trave: 5.70 rpm : 275 Rack travel in mm : 5.00...5.20 CONSTANT REGULATION rpm : 350...480 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1175 Rack travel in m: 13.40...13.50 rpm : 700 2nd speed Rack travel in m: 12.55...12.75 rpm : 300 3rd speed Rack travel in m: 11.70...12.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 1175 rom

hPa : 1000

Rack travel mm : 13.40...13.50

1/min : 1175 Speed 1st pressure hPa : -Rack travel in m: 9.90...10.10 2nd pressure hPa : 420 Rack travel in m: 11.65...11.75 3rd pressure hPa : 240 Rack travel in m: 10.60...10.80 START CUT-OUT Speed 1/min : 200 (220) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 Speed rpm : 700 Del.quantity cm3/: 149.0...153.0 1000 s: (146.0...156.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 79.0...81.0 1000 s: (76.5...83.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.40 Speed rpm : 1255...1265 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 100.0...130.0 1000 s: (96.0...134.0) LOW IDLE Speed rpm : 275 Rack travel in mm : 4.90...5.30 Del.quantity cm3/: 23.0...27.0 1000 s: (23.0...27.0) cm3 : 4.50 Spread 1000 s: (7.50) Remarks: : Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Pressure

Measurement

Note remarks

Test sheet

Edition

: 27.11.92

Replaces

Test oil

: ISO-4113

Combination no.

: 0 403 444 110A

Injection pump

Pump designation : PES4MW100/720RS1127

EP type number

: 0 413 404 103

Governor

Governor design. : RQV300...1300MW48-1

Governer no.

: 0 420 083 084

Customer-spec. information Customer

: MB-NF7

Engine

: OM 364 LA

1st version kW

: 85.0

Rated speed

: 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Lenath mm

: 8.00X2.50X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 3.70...3.80

: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing

: 0-90-180-270

Tolerance + - °

: 0.50 (0.75)

BASIC SETTING

1st speed

rom : 1300

Rack travel in mm: 10.70...10.80

Del.quantity cm3/: 8.0...8.2

100 s: (7.8...8.4)

Spread

cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm: 6.8...5.9

Del.quantity cm3/: 1.0,..1.4

Spread

100 s: (0.7...1.6)

cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed travel mm rpm : 1340

2nd speed

: 8.50...8.70

travel mm

rpm : 1450

3rd speed

: 9.50...9.90 rpm : 500

travel mm

: 2.70...3.30

4th speed

Speed

rpm : 300

travel mm

: 1.30...1.70

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1340

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Del.quantity

rpm : 1300

Aneroid pressure h: 700

: 80.0...82.0

1000 : (78.0...84.0)

cm3

: 3.50

1000 : (6.00)

RATED SPEED

Spread

1st version Control Lever

position degrees: 99...107

Testing:

1st rack travel in: 10.70

Speed rpm : 1340...1350

2nd rack travel in: 4.00

rpm : 1445...1475 Speed

4th rack travel in: 1550

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 72...80

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.8

Testing:

Speed : 200 rpm Minimum rack trave: 8,40

rpm : 300 Speed

Rack travel in mm : 6.80...6.90

CONSTANT REGULATION

Speed rpm : 320...550

TORQUE CONTROL

Torque control curve - 1st version

1st speed

2nd speed rpm : 750

rom : 1175 3rd speed

Rack travel in m: 11.00...11.40

Compensator Test

1st version

Setting

Measurement

Speed

Rack travel in m: 11.00...11.20

Rack travel in m: 11.60...11.80

START CUT-OUT

1/min : 220 (250) Speed

FUEL DELIVERY CHARACTERISTICS

rpm : 1300

Rack travel in m: 10.70...10.80

Rack travel in m: 11.60...11.80

Aneroid/Altitude

: 500 Speed man Pressure hPa : -

Rack travel mm : 10.00...10.20

1/min: 500

1st pressure hPa : 300

3rd pressure hPa : 700

F26

1st version

Aneroid pressure h: 700

: 750 Speed rpm

Del.quantity cm3/: 75.5...78.5 1000 s: (73.0...81.0)

cm3 : 5.00 Spread

1000 s: (7.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 46.0...48.0 1000 s: (44.0...50.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70

rpm : 1340...1350 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 85.0...95.0

1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.80...6.90

Del.quantity_cm3/ : 10.0...14.0

1000 s: (7.5...16.5) cm3 : 3.50

1000 s: (5.50)

Remarks:

Spread

BOSCH INJ. PUMP TEST SPECIFIC TIONS Prestroke mm : 4.00...4.10 : (3.95...4.15) Note remarks Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Test sheet : FIA 8,1 D Edition : 21.08.92 Replaces : C7,92 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 403 446 249 Tolerance + - ° : 0.50 (0.75) Injection pump BASIC SETTING Pump designation : PES6MW100/720RS1197 EP type number : 0 413 406 185 1st speed rpm: 1350 Governor Governor design. : RQV325...1350MW109K Rack travel in mm : 14.00...14.10 Governer no. : 0 420 083 997 Del.quantity cm3/: 10.1...10.3 Customer-spec, information Customer : IVECO-FIAT 100 s: (9.9...10.5) : 8060.45.6000 Engine Spread cm3 : 0.31st version kW : 169.0 100 s: (0.6) Rated speed : 2700 2nd speed rpm : 325.0 Rack travel in mm : 7.7...7.9 TEST BENCH REQUIREMENTS Del.quantity cm3/: 2.5...2.9 Test oil 100 s: (2.2...3.1) inlet temp. °C : 38...42 cm3 : 0.3Spread 100 s: (0.5) Overflow valve : 1 457 413 010 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 1400 : 1 688 901 101 assembly travel mm : 10.00...10.40 2nd speed rpm : 825 Opening travel mm : 4.90...5.10 pressure, bar : 207...210 3rd speed : 400 rpm travel mm : 2.90...3.50 Orifice plate 4th speed : 325 rpm diameter mm : 0,6 travel mm : 1.50...1.90 FULL LOAD DELIV. AT FULL LOAD STOP Test lines : 1 680 750 014 1st version Outside diameter Speed rpm : 1350x Wall thickness Aneroid pressure h: 850 x Length mm : 6.00x2.00x600 Del.quantity : 101.0...103.0 1000 : (99.0...105.0) (A) Injection pump setting values Spread : 3.50 cm3 1000 : (6.00) Insp. values in parentheses Set equal delivery quant. per values RATED SPEED BEGINNING OF DELIVERY 1st version

Control lever

position degrees: 117...125

Test pressure, bar: 30...32

Testing: 1st rack travel in: 13.00 rpm : 1420...1430 2nd rack travel in: 4.00 Speed rpm : 1520...1550 4th rack travel in: 1650 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 78...86 Setting point w/out bumper spring rom Rack travel in mm: 7.8 Testing: : 200 Speed rpm Minimum rack trave: 10.00 Speed rom : 325 Rack travel in mm : 7.70...7.90 TORQUE CONTROL 1st speed rpm : 1350 Rack travel in m: 14.00...14.10 nd speed rpm : 1200 Rack travel in m: 13.60...13.80 2nd speed 3rd speed rpm : 1000Rack travel in m: 13.20...13.50 rpm : 700 4th speed Rack travel in m: 13.30...13.50 Aneroid/Altitude Compensator Test 1st version Settina Speed : 500 rpm Pressure hPa : -Rack travel mm : 11.20...11.30 Measurement $1/\min : 500$ Speed 1st pressure hPa : 350 Rack travel in m: 11.90...12.00 2nd pressure hPa : 550 Rack travel in m: 12.80...13.10 3rd pressure hPa : 850 Rack travel in m: 13.30...13.50

Torque control curve - 1st version FUEL DELIVERY CHARACTERISTICS 1st version

Del.quantity cm3/: 100.5...103.5 1000 s: (98.0...106.0) cm3 : 5.00Spread 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 79.0...81.0 1000 s: (77.0...83.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.00 Speed rpm : 1420...1430

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 55.0...75.0 1000 s: (52.0...78.0)

LOW IDLE

Speed rpm : 325 Rack travel in mm : 7.70...7.90 Del.quantity cm3/: 25.0...29.0

1000 s: (22.5...31.5) cm3 : 3.50 1000 s: (5.50) Spread

Remarks:

* Adjusting starting fuel delivery (0 403 446 249)

1. Cold start

- Loosen adjusting screw for lug cam
- Fully screw in TAS
- Set engine speed 100 1/min Screw in adjusting screw until control-rod travel jumps from 13.4 mm to 21 mm; in doing so, constantly move control lever back and forth from idle to full-load position
- Lock adjusting screw
- Screw in cap for limiting starting fuel delivery. Delivery rate 95...115 ccm/1000 strokes
- 2. Warm start
 - Set engine speed 265...275 1/min - Screw out TAS until control-rod travel jumps from 11.2 mm to

Speed

Aneroid pressure h: 850

rpm : 1200

- 13.4 mm. In doing so, constantly move control lever back and forth from idle to full-load position. Lock TAS
- Set engine speed 100 1/min, control lever in full-load position. Control-rod travel must not exceed 13.4 mm.

 - Delivery rate 55...75 ccm/1000
- strokes

BOSCH INJ. PUMP TEST SPECIFICATIONS Firing order Note remarks Test sheet : VOL Phasing Edition : 11.01.93 Replaces Test oil : ISO-4113 Combination no. : 0 403 446 290 1st speed Injection pump Pump designation : PES6MW100/320RS1224 EP type number : 0 413 406 210 Governor Governor design. : RQV350...1100MW120K Governer no. : 0 420 083 993 Customer-spec. information Spread Customer : VME Engine : TD 61 KBE 2nd speed 1st version kW : 115.0 Rated speed : 2200 TEST BENCH REQUIREMENTS Spread Test oil inlet temp. °C : 38...42 Overflow valve : 1 457 413 010 Inlet press., bar: 1.50 Test nozzle holder assembly : 0 681 343 009 Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter Speed x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Spread Insp. values in parentheses Set equal delivery quant. per values ____ BEGINNING OF DELIVERY Test pressure, bar: 30...32

: **3.00**...**3.10** : (2.95...**3.15**)

Rack travel in mm: 9.00...12.00

: 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING rpm: 1100Rack travel in mm : 14.20...14.30 Del.guantity cm3/: 12.4...12.6 100 s: (12.2...12.8) cm3 : 0.3100 s: (0.6) rpm : 350.0 Rack travel in mm: 5.8...6.0 Del.quantity cm3/ : 1.4...1.8 100 s: (1.1...2.0) cm3 : 0.3100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1150 1st speed : 9.80...10.20 travel mm rpm : 850 2nd speed travel mm : 6.90...7.10 3rd speed rpm : 550 : 3.50...4.10 travel mm 4th speed rpm : 350 travel mm : 1.00...1.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 1100Aneroid pressure h: 1500 Del.quantity : 124.0...126.0 1000 : (122.0...128.0) : 3.50 cm3 1000 : (6.00) RATED SPEED 1st version Control lever position degrees: 118...126 Testing: 1st rack travel in: 13.20

: 1-5-3-6-2-4

Prestroke mm

rpm : 1140...1150 Speed 2nd rack travel in: 4.00 rpm : 1255...1285 Speed 4th rack travel in: 1350 boea2 rpm : 0.10...1.00LOW IDLE 1 Control lever position degrees: 68...76 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 5.9 Testing: Speed rpm : 200 Minimum rack trave: 7.50 rpm : 350 Rack travel in mm : 5.80...6.00 Rack travel in mm : 2.00 Speed rpm : 470...530 TORQUE CONTROL Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 14.20...14.30 rpm : 830 2nd speed Rack travel in m: 14.90...15.00 3rd speed rpm : 735 Rack travel in m: 14.50...14.70 4th speed rpm : 600 Rack travel in m: 13.20...13.60 5th speed rpm : 970 Rack travel in m: 14.40...14.80 Aneroid/Altitude Compensator Test 1st version Setting Speed man : 830 hPa : 250 Pressure : 11.30...11.40 Rack travel mm Measurement 1/min : 830 Speed 1st pressure hPa : 1500 Rack travel in m: 14.90...15.00 2nd pressure hPa : -Rack travel in m: 10.70...10.80 3rd pressure hPa : 660 Rack travel in m: 14.50...14.70 START CUT-OUT 1/min : 270 (290) Speed FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 1500 rpm : 830 Del.quantity cm3/: 135.0...139.0 1000 s: (132.0...142.0) cm3 : 6.00 1000 s: (9.0) Spread Aneroid pressure h: -Speed rpm : 550 Del.quantity cm3/ : 61.0...63.0 1000 s: (59.0...65.0) RACK STOP ADJUSTMENT rpm : 100 Speed BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.20 rpm : 1140...1150 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 90.0...110.0 1000 s: (87.0...113.0) Rack travel in mm : 19.00...21.00 LOW IDLE rpm : 350 Speed Rack travel in mm : 5.80...6.00 Del.quantity cm3/: 14.0...18.0 1000 s: (11.5...20.5) cm3 : 3.50Spread 1000 s: (5.50) Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Test pressure, bar: 30...32 Note remarks Prestroke mm : 3.00...3.10 : (2.95...3.15) Rack travel in mm : 13.50...0.00 Test sheet : DAF Edition : 21,09,92 Firing order : 1- 5- 3- 6- 2- 4 Replaces Test oil : ISO-4113 Combination no. : 0 403 446 310 Phasing : 0-60-120-180-240-300 Phasing Injection pump Tolerance + - ° : 0.50 (0.75) Pump designation : PES6MW100/320RS1227Z EP type number : 0 413 406 217 BASIC SETTING Governor Governor design. : RQV325...1300MW126 1st speed rpm: 1000 : 0 420 083 279 Coverner no. Rack travel in mm : 11.60...11.70 : 1249952 Cust. part no. Del.quantity cm3/ : 9.0...9.2 Customer-spec. information Customer : DAF 100 s: (8.3...9.4) Engine : NS133L Spread cm3 : 0.31st version kW : 133.0 100 s: (0.6) Rated speed : 2600 2nd speed rpm : 325.0 Rack travel in mm : 4.4...4.6 Del.quantity cm3/ : 0.7...1.1 TEST BENCH REQUIREMENTS Test oil 100 s: (0.4...1.3) inlet temp. °C : 38...42 Spread cm3 : 0.3100 s: (0.5) Overflow valve : 1 419 992 198 (B) Setting of injection pump with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL Test nozzle holder 1st speed rpm : 1350 : 1 688 901 101 assembly : 8.40...8.80 travel mm 2nd speed ; 875 * 4.90...5.10 875 rpm Openina travel mm pressure, bar : 207...210 : 500 3rd speed rpm travel mm : 2.70...3.30 Orifice plate 4th speed : 325 rpm diameter mm : 0,6 : 1.50...1.90 travel mm FULL LOAD DELIV. AT FULL LOAD STOP Test Lines : 1 680 750 008 1st version Outside diameter Speed rpm : 1000 x Wall thickness Aneroid pressure h: 1000 x Length mm : 6.00X2.00X600 Del.quantity : 90.0...92.0 1000 : (88.0...94.0) (A) Injection pump setting values : 3.50 Spread cm3 Insp. values in parentheses 1000 : (6.00) Set equal delivery quant. per values ____ RATED SPEED BEGINNING OF DELIVERY 1st version

GO4

Control lever

position degrees: 118...126

Testing:

1st rack travel in: 10.60

rpm : 1330...1340 Speed

2nd rack travel in: 4.00

rpm : 1440...1470 Speed

4th rack travel in: 1550

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 78...86

Setting point w/out bumper spring

rpm : 325 Rack travel in mm: 4.5

Testing:

Speed rpm : 150

Minimum rack trave: 7.00

rpm : 325

Rack travel in mm : 4.40...4.60

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 600 man hPa : 1000 Pressure

Rack travel mm : 11.60...11.70

Measurement

Speed 1/min: 600

1st pressure hPa : 290 Rack travel in m: 11.20...11.30

2nd pressure hPa : 160

Rack travel in m: 10.30...10.60

3rd pressure hPa : -

Rack travel in m: 9.90...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1300

Del.quantity cm3/: 89.5...92.5

1000 s: (87.0...95.0)

Spread cm3 : 5.00

1000 s: (7.0)

Aneroid pressure h: -

Speed rpm : 600

Del.quantity cm3/: 62.0...64.0

1000 s: (60.0...66.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.60

Speed rpm : 1330...1340

LOW IDLE

rpm : 325 Speed

Rack travel in mm : 4.40...4.60

Del.quantity cm3/ : 7.0...11.0 1000 s: (4.5...13.5)

cm3 : 3.50

1000 s: (5.50)

Remarks:

Spread

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Note remarks

Test sheet

: 22.01.93 Edition

Replaces

Test oil : ISO-4113

Combination no. : 0 403 446 311

Injection pump

Pump designation: PES6MW100/720RS1131-

EP type number : 0 413 406 165

Governor

Governor design. : RQV300...1300MW50-28

Governer no. : 0 420 083 281

Customer-spec. information Customer : MB-NFZ

Engine : 0M366LA

1st version kW : 155.0 Rated speed : 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly : 0 681 343 009

Opening (

pressure, bar : 172...175

Test Lines : 1 680 750 089

Outside diameter

x Wall thickness

: 8.00x2.50x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.60...3.70

: (3.55...3.75)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

BASIC SETTING

rpm: 1300 1st speed

Rack travel in mm : 13.10...13.20

Del.quantity cm3/: 9.8...10.0

100 s: (9.6...10.2)

Spread cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed Rack travel in mm: 6.4...6.6

Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

: 9.40...10.00 travel mm

2nd speed rpm : 1350

: 8.50...8.70 travel mm

3rd speed : 500 rpm

: 2.70...3.30 travel mm

4th speed : 300 rpm

travel mm : 1.20...1.60

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

rpm : 1350

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 1000 Del.quantity

: 98.0...100.0

1000 : (96.0...102.0)

: 3.50 cm3

1000 : (6.00)

RATED SPEED

Spread

1st version Control lever

position degrees: 112...120

Setting point:

Speed rpm : 1350 Rack travel in mm: 16.5

Testina:

1st rack travel in: 12.10

rpm : 1340...1350 Speed

2nd rack travel in: 4.00

rpm : 1455...1485 Speed

4th rack travel in: 1550

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 74...82

Setting point w/out bumper spring

rpm : 300 Rack travel in mm: 6.5

Testing:

Speed rpm : 200 Minimum rack trave: 8.00 rpm : 300

Rack travel in mm : 6.40...6.60

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : 1000 Pressure

Rack travel mm : 13.10...13.20

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 10.30...10.40

2nd pressure hPa : 200

Rack travel in m: 11.20...11.30

3rd pressure hPa : 350

Rack travel in m: 12.40...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 750

Del.quantity cm3/: 87.0...91.0 1000 s: (85.0...93.0)

cm3 : 5.00

1000 s: (7.0)

Ameroid pressure h: -

rpm : 500

Del.quantity cm3/: 36.0...38.0

1000 s: (34.0...40.0)

BREAKAWAY

Spread

1st version

1mm rack travel less than

full load rack tr: 12.10

rpm : 1340...1350 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...110.0

1000 s: (97.0...113.0)

LOW IDLE

Speed rom : 300

Rack travel in mm : 6.40...6.60 Del.quantity cm3/: 10.0...14.0

1000 s: (7.5...16.5)

cm3 : 3.50 Spread 1000 s: (5.50)

Remarks:

GO7

BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4Note remarks Test sheet Edition : 22.01.93 Phasing : 0-60-120-180-240-300 Replaces Test oil : ISO-4113 Tolerance + - ° : 0.50 (0.75)Combination no. : 0 403 446 312 BASIC SETTING Injection pump 1st speed rpm : 1300Pump designation: PES6Mw100/720RS1131-Rack travel in mm : 13.10...13.20 EP type number : 0 413 406 165 Governor Del.quantity cm3/: 9.8...10.0 Governor design: RQV300...1300Mw50-29 : 0 420 083 282 100 s: (9.6...10.2) Governer no. Customer-spec. information cm3 : 0.3 Spread Customer : MB-NFZ 100 s: (0.6) Engine : 0M366LA rpm : 300.02nd speed : 155.0 1st version kw Rack travel in mm: 6.4...6.6 Rated speed : 2600 Del.quantity cm3/ : 1.0...1.4 100 s: (0.7...1.6) TEST BENCH REQUIREMENTS Spread cm3 : 0.3100 s: (0.5) Test oil inlet temp. °C : 38...42 (B) Setting of injection pump with governor Overflow valve : 1 419 992 198 GUIDE SLEEVE TRAVEL 1st speed rpm : 1450 Inlet press., bar: 1.50 travel mm : 9.40...10.00 2nd speed rpm : 1350 Test nozzle holder : 8.50...8.70 travel mm assembly : 0 681 343 009 3rd speed : 500 rom 2.70...3.30 travel mm Opening. 300 4th speed rpm pressure, bar : 172...175 : 1.20...1.60 travel mm GUIDE SLEEVE POSITION Test lines : 1 680 750 089 Control-lever position Degree: -1 Outside diameter rpm : 1350 Speed × Wall thickness Rack travel in mm : 15.20...17.80 x Length mm : 8.00x2.50x600 FULL LOAD DELIV. AT FULL LOAD STOP (A) Injection pump setting values Insp. values in parentheses 1st version Set equal delivery quant. Speed rpm : 1300per values Aneroid pressure h: 1000 Del.quantity : 98.0...100.0 BEGINNING OF DELIVERY 1000 : (96.0...102.0) Test pressure, bar: 30...32 Spread cm3 : 3.50 1000 : (6.00) Prestroke mm : 3.60...3.70

RATED SPEED

: (3.55...3.75)

1st version Control lever

position degrees: 112...120

Setting point:

Speed rpm : 1350 Rack travel in mm : 16.5

Testing:

ist rack travel in: 12.10

rpm : 1340...1350 Speed

2nd rack travel in: 4.00

rpm : 1455...1485 Speed

4th rack travel in: 1550

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 74...82

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 6.5

Testing:

Speed rpm : 200 Minimum rack trave: 8.00

Speed rpm : 300 Rack travel in mm : 6.40...6.60

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm Pressure hPa : 1000

: 13.10...13.20 Rack travel mm

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 10.30...10.40

2nd pressure hPa : 200

Rack travel in m: 11.20...11.30

3rd pressure hPa : 350

Rack travel in m: 12.40...12.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000 Speed rpm : 750

Del.quantity cm3/: 87.0...91.0

1000 s: (85.0...93.0)

cm3 : 5.00 1000 s: (7.0) Spread

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 36.0...38.0

1000 s: (34.0...40.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10

rpm : 1340...1350 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 100.0...110.0

1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.40...6.60

Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5)

cm3 : 3.50

1000 s: (5.50)

Remarks:

Spread

G09

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : FIA Edition : 25.09.92 Replaces : 07.92 Test oil : ISO-4113 Combination no. : 0 403 446 313 Injection pump Pump designation : PES6MW100/720RS1228 : 0 413 406 213 EP type number Governor Governor design. : RQV325...1350Mw127k : 0 420 083 988 Governer no. Customer-spec. information Customer : IVECO-FIAT Engine : 8060.45.6200 1st version kW : 167.0 Rated speed : 2700 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 457 413 010 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 101 Opening. pressure, bar : 207...210 Orifice plate diameter mm : 0,6 Test lines : 1 680 750 014

: 4.00...4.10 : (3.95...4.15) Rack travel in mm : 9.00...12.00 Firing order : 1-5- 3- 6- 2- 4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) BASIC SETTING 1st speed com : 700 Rack travel in mm : 12.20...12.30 Del.quantity cm3/ : 11.5...11.7 100 s: (11.3...11.9) Spread cm3 : 0.3100 s: (0.6) rpm : 325.02nd speed Rack travel in mm : 6.5...6.7 Del.quantity cm3/ : 2.0...2.4 100 s: (1.7...2.6) Spread cm3 : 0.3100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1400 1st speed : 10.00...10.40 travel mm 2nd speed rpm : 825 : 4.90...5.10 travel mm 3rd speed rpm : 400 travel mm : 2.90...3.50 4th speed : 325 rpm : 1.50...1.90 travel mm FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Speed Aneroid pressure h: 1200 : 115.5...117.5 : (113.5...119.5) Del.quantity 1000 : 3.50 Spread cm3 1000 : (6.00) RATED SPEED 1st version

Prestroke mm

Control Lever

position degrees: 120...128

Outside diameter

x Wall thickness

: 6.00x2.00x600

(A) Injection pump setting values

Set equal delivery quant.

per values

Test pressure, bar: 30...32

BEGINNING OF DELIVERY

Insp. values in parentheses

x Length mm

Testing:

1st rack travel in: 12.10

rpm : 1420...1430 Speed

2nd rack travel in: 4.00

rpm : 1515...1545 Speed

4th rack travel in: 1600

Speed rpm : 0.00...1.00

LOW IDLE 1

Control Lever

position degrees: 78...86

Setting point w/out bumper spring

rpm : 325 Rack travel in mm: 6.6

Testing:

Speed rpm : 200 Minimum rack trave: 10.00

: 325 rom

Rack travel in mm : 6.50...6.70

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 700

Rack travel in m: 12.20...12.30

rpm : 1200 2nd speed

Rack travel in m: 13.40...13.60

3rd speed rpm : 900

Rack travel in m: 12.60...12.80

4th speed rpm : 1350

Rack travel in m: 13.10...13.30

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 1200 man

Pressure hPa : -

: 8.90...9.10 Rack travel mm

Measurement

Speed 1/min: 1200

1st pressure hPa : 450

Rack travel in m: 10.50...10.60

2nd pressure hPa : 800

Rack travel in m: 12.50...12.80

3rd pressure hPa : 1200

Rack travel in m: 13.40...13.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed

rpm : 1200

Del.quantity cm3/: 120.0...123.0 1000 s: (117.5...125.5)

Spread cm3 : 5.00

1000 s: (7.0)

Aneroid pressure h: -

: 500 rpm

Del.quantity cm3/: 71.0...73.0 1000 s: (69.0...75.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.10

rpm : 1420...1430 Speed

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 40.0...60.0

1000 s: (37.0...63.0)

LOW IDLE

rpm : 325 Speed

Rack travel in mm : 6.50...6.70

Del.quantity cm3/: 20.0...24.0 1000 s: (17.5...26.5) Spread cm3 : 3.50 1000 s: (5.50)

:

Remarks:

* Adjusting starting fuel delivery (0 403 446 313)

1. Pre-setting

- Loosen adjusting screw for Lug cam - TAS pre-setting dimension: 59.8...66.2 mm (depth gauge)

2. Set manifold-pressure compensator (LDA)

3. Cold start

- Screw in TAS approx. 3 turns

- Set cold-start interlock at engine

speed 280 1/min

- Check release at engine speed

100 1/min

- Set TAS to 9.4...9.6 mm at an engine speed of 500 1/min

Note remarks

Test sheet

: M8

Edition

: 03.02.93

Replaces

Test oil

: ISO-4113

Combination no. : 0 403 446 320

Injection pump

Pump designation : PES6MW100/720RS1131

EP type number

: 0 413 406 123

Governor

Governor design. : RQV300...1300Mw67-8

Governer no.

: 0 420 083 290

Customer-spec. information Customer

: MB-NFZ

Engine

: OM 366 A

1st version kW

: 121.0

Rated speed

: 2600

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Openina .

pressure, bar

: 172...175

Test lines

: 1 680 715 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 3.70...3.80

: (3.65...3.85)

Rack travel in mm ; 9.00...12.00

Del.quantity

1000

: (86.0...92.0)

Spread

RATED SPEED

Control lever

position degrees: 116...124

1st rack travel in: 9.50

G13

Firing order

: 1-5- 3- 6- 2- 4

: 0-60-120-180-240-300

Phasing

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

BASIC SETTING

1st speed

rpm: 1300

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 8.8...9.0

100 s: (8.6...9.2)

Spread

2nd speed

Spread

cm3 : 0.3

100 s: (0.6)

rpm : 300.0Rack travel in mm: 5.6...5.8

Del.quantity cm3/: 1.0...1.4

100 s: (0.7...1.6)

cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

rpm : 1450 1st speed travel mm

: 9.50...9.90

2nd speed

rpm : 1350

travel mm 3rd speed

: 8.60...8.80 rpm : 500

travel mm

travel mm

: 2.70...3.30

4th speed

rpm : 300

: 1.20...1.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1300

Aneroid pressure h: 700

: 88.0...90.0

cm3 : 3.50 1000 : (6.00)

1st version

Testing:

Speed rpm : 1340...1350 2nd rack travel in: 4.00 Speed rpm : 1415...1445 4th rack travel in: 1550 rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 69...77 Setting point w/out bumper spring rpm : 300 Rack travel in mm : 5.7 Testina: Speed rpm : 200 Minimum rack trave: 7.50 rom : 300 Rack travel in mm : 5.60...5.80 TORQUE CONTROL Dimension a mm : 0.80 Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 10.50...10.60 2nd speed rpm : 850 Rack travel in m: 11.20...11.40 3rd speed rpm : 1100 Rack travel in m: 10.70...10.90 Aneroid/Altitude Compensator Test

1st version
Setting
Speed rpm : 500
Pressure hPa : 700
Rack travel mm : 11.20...11.40

Measurement

Speed 1/min: 500

1st pressure hPa : Rack travel in m: 9.20...9.30
2nd pressure hPa : 300
Rack travel in m: 9.70...9.90
3rd pressure hPa : 400
Rack travel in m: 10.40...10.60

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version Aneroid pressure h: 700 Speed rpm : 850 Del.quantity cm3/: 88.0...91.0 1000 s: (85.5...93.5) Spread cm3 : 5.00 1000 s: (7.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 49.0...51.0 1000 s: (47.0...53.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 9.50 Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 80.0...90.0 1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 300
Rack travel in mm : 5.60...5.80
Del.quantity cm3/ : 10.0...14.0
1000 s: (7.5...16.5)
Spread cm3 : 3.50

pread cm3 : 3.50 1000 s: (5.50)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4Note remarks Test sheet : MAN Edition : 18.12.92 Phasing : 0-60-120-180-240-300 Replaces : 09.92 Test oil : ISO-4113 Tolerance + - ° : 0.50 (0.75) Combination no. : 0 403 456 125 Time to cyl. no. : 1 Injection pump BASIC SETTING Pump designation : PES6MW100/321RS1201 EP type number : 0 413 406 190 1st speed rpm: 800 Governor : RQV250...975/1200MW1 Governor design. Rack travel in mm : 12.80...12.90 28 - 1: 0 420 083 289 Governer no. Del.quantity cm3/: 14.1...14.3 Customer-spec. information 100 s: (13.8...14.6) Customer : MAN Spread cm3 : 0.4Engine : D 0826 LF02 100 s: (0.7) : 169.0 1st version kW 2nd speed rpm : 250.0 Rack travel in mm : 5.4...5.6 Rated speed : 2400 TEST BENCH REQUIREMENTS Del.quantity cm3/ : 1.6...2.0 100 s: (1.3...2.2) Test oil Spread cm3 : 0.3inlet temp. °C : 38...42 100 s: (0.5) Overflow valve (B) Setting of injection pump : 1 419 992 198 with governor Inlet press., bar: 1.50 GUIDE SLEEVE TRAVEL 1st speed rpm : 1250 Test nozzle holder travel mm : 11.00...11.20 : 0 681 343 009 assembly rpm : 10502nd speed : 9.30...9.70 travel mm **Opening** 3rd speed : 650 rpm pressure, bar : 172...175 travel mm 4.20...4.80 4th speed 350 rpm travel mm 2.10...2.50 Test lines : 1 680 750 008 250 5th speed rpm : 1.20...1.40 travel mm Outside diameter x Wall thickness FULL LOAD DELIV. AT FULL LOAD STOP x Length mm : 6.00x2.00x600 1st version (A) Injection pump setting values Speed rpm : 800 Insp. values in parentheses Aneroid pressure h: 1000 Set equal delivery quant. Del.quantity : 141.0...143.0 1000 : (138.0...146.0) per values

Spread cm3 : 4.00 1000 : (7.50)

RATED SPEED

1st version

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

: 3.50...3.60 : (3.45...3.65)

Control lever position degrees: 123...131 Testing: 1st rack travel in: 11,40 rpm : 1245...1260 Speed 2nd rack travel in: 4.00 rpm : 1295...1325 Speed 4th rack travel in: 1400 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 76...84 Setting point w/out bumper spring rpm : 250 Rack travel in mm : 5.5 Testing: Speed rpm : 150 Minimum rack trave: 7.00 rpm : 250 Rack travel in mm : 5.40...5.60 TORQUE CONTROL Dimension a mm : 0.40 Torque control curve - 1st version rpm : 800 1st speed Rack travel in m: 12.80...12.90 rpm : 600 2nd speed Rack travel in m: 12.70...12.90 3rd speed rpm : 1000 Rack travel in m: 12.50...12.70 4th speed rpm : 1200 Rack travel in m: 12.40...12.60 Aneroid/Altitude Compensator Test 1st version Settina rpm : 500 Speed hPa : 1000 Pressure Rack travel mm : 12.70...12.90 Measurement $1/\min: 500$ Speed 1st pressure hPa : -Rack travel in m: 10.30...10.40 2nd pressure hPa : 155 Rack travel in m: 10.60...10.70 3rd pressure hPa : 550 Rack travel in m: 12.20...12.50 FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 1000
Speed rpm : 600
Del.quantity cm3/: 139.0...143.0
1000 s: (136.0...146.0)
Spread cm3 : 6.00
1000 s: (9.0)
Aneroid pressure h: Speed rpm : 500
Del.quantity cm3/: 74.0...76.0
1000 s: (72.0...78.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.40 Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 60.0...80.0 1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250
Rack travel in mm : 5.40...5.60
Del.quantity cm3/ : 16.0...20.0
1000 s: (13.5...22.5)

Spread cm3 : 3.50 1000 s: (5.50)

Remarks:

: MAN #3-7197

Start-of-delivery mark is at start of delivery of cylinder 1

1st version

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.50...3.60 : (3.45...3.65) Rack travel in mm : 9.00...12.00 Note remarks : 1-5- 3- 6- 2- 4 Firing order Test sheet : CUM 8,3 N : 18.12.92 Edition Replaces : 11.92 Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 403 466 121 Tolerance + - ° : 0.50 (0.75)Injection pump Time to cyl. no. : 1 Pump designation : PES6MW100/120RS1184 EP type number : 0 413 406 171 BASIC SETTING Governor Governor design. : RSV375...1250MW2A334 1st speed rpm : 1250Governer no. : 0 420 085 122 Rack travel in mm : 11.30...11.40 Customer-spec. information Customer : CUMMINS Del.quantity cm3/: 12.4...12.6 : 6 BTAA 5.9 Engine 100 s: (12.2...12.8) 1st version kw : 157.0 Spread cm3 : 0.3: 2500 Rated speed 100 s: (0.6) TEST BENCH REQUIREMENTS 2nd speed rpm : 375.0Test oil Rack travel in mm: 6.5...7.0 Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6) inlet temp. "C : 38...42 Overflow valve Spread cm3 : 0.3: 1 419 992 198 100 s: (0.5) Inlet press., bar: 1.50 GUIDE SLEEVE POSITION Control-lever position Test mozzle holder Degree: -3 assembly : 1 688 901 101 rpm : 800 Speed Rack travel in mm : 0.30...1.00 Opening : 207...210 Governor spring pre-tension pressure, bar Click setting x : 3.00Orifice plate diameter mm : 0,6 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Test lines : 1 680 750 014 Speed rpm : 1250 Aneroid pressure h: 1000 Aneroid Deliquantity 1000 Outside diameter : 124.0...126.0 x Wall thickness : (122.0...128.0) x Length mm : 6.00x2.00x600 : 3.50 Spread cm3 1000 : (6.00)(A) Injection pump setting values Insp. values in parentheses RATED SPEED Set equal delivery quant. per values ____ 1st version Control lever BEGINNING OF DELIVERY position degrees: 104...112 Test pressure, bar: 30...32

Setting point:

Speed **LDu** : 800 Rack travel in mm: 0.6

Testing:

1st rack travel in: 10.30 rpm : 1295...1305 Speed

2nd rack travel in: 4.00

rpm : 1370...1400 Speed

3rd rack travel in: 4.00

Speed rpm : 1415...1445 4th rack travel in: 1550

Speed rpm : 0.30...1.70

LOW IDLE 1 Control lever

position degrees: 80...88

Setting point w/out bumper spring

mom Rack travel in mm: 5.7

Testina:

Speed rpm : 100 Minimum rack trave: 19.00 rpm : 375 Speed

Rack travel in mm: 5.50...6.00

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm Pressure hPa : 1000

: 11.30...11.40 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 10.50...10.60

2nd pressure hPa : 650

Rack travel in m: 10.80...10.90

3rd pressure hPa : 720

Rack travel in m: 11.00...11.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 102.0...104.0

1000 s: (100.0...106.0)

cm3 : 5.00Spread

1000 s: (7.00)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.30

rpm : 1295...1305 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 75.0...85.0

1000 s: (72.0...88.0)

LOW IDLE

Speed rpm : 375

Rack travel in mm : 6.50...7.00 Del.quantity cm3/: 10.0...14.0 1000 s: (7.5...16.5)

cm3 : 3.50 1000 s: (5.50) Spread

Remarks:

: CUN #3280646

Start-of-delivery mark 9° cam angle after start of delivery cyl. 1.

Note remarks

Test sheet : CUM

: 03.02.93 Edition Replaces : 11.92

Test oil : ISO-4113

Combination no. : 0 403 466 130

Injection pump

Pump designation : PES6MW100/120RS1137~

EP type number : 0 413 406 180

Governor

Governor design. : RSV550...1100Mw2A335

: 0 420 085 206 Governer no.

Customer-spec. information Customer : CUMMINS

Engine : 6 CTA

1st version kW : 179.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

; 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order

: 1-5- 3- 6- 2- 4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 14.40...14.50

Del.quantity cm3/: 15.2...15.4

100 s: (14.9...15.7)

Spread

cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 550.0

Rack travel in mm: 6.6...7.0

Del.quantity cm3/: 1.8...2.2

100 s: (1.6...2.5)

cm3 : 0.3Spread

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

rpm : 800 Speed

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting \bar{x} : 4.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

: 152.5...154.5 Del.quantity

1000 : (149.5...157.5)

cm3 Spread : 4.00

1000 : (7.50)

RATED SPEED

1st version

Control lever

position degrees: 93...101

G19

Setting point:

Speed rpm : 800 Rack travel in mm: 0.6

Testing:

1st rack travel in: 13.50

Speed rpm : 1165...1175

2nd rack travel in: 4.00

Speed rpm : 1240...1250

3rd rack travel in: 4.00

Speed rpm : 1240...1270 4th rack travel in: 1350

rpm : 0.30...1.70Spaged

LOW IDLE 1

Control lever

position degrees: 68...76 Setting point w/out bumper spring

Speed rpm : 550

Rack travel in mm: 6.3

Testing:

Speed rpm : 100 Minimum rack trave: 19.00

rpm : 550

Rack travel in mm : 6.20...6.40

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rem hPa : 900 Pressure

Rack travel mm : 14.50...14.60

Measurement

Speed $1/\min: 500$

1st pressure hPa : -

Rack travel in m: 11.40...11.60

2nd pressure hPa : 400

Rack travel in m: 12.30...12.40

3rd pressure hPa : 630

Rack travel in m: 13.80...14.20

FUEL DELIVERY CHARACTERISTICS

1st version

Ameroid pressure h: -

Speed rpm : 500

Del.quantity cm3/: 98.0...100.0

1000 s: (96.0...102.0)

BREAKAWAY

1st version

G20

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 1165...1175

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 130.0...150.0

1000 s: (127.0...153.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 550

Rack travel in mm : 6.60...7.00 Del.quantity cm3/: 18.5...22.5

1000 s: (16.0...25.0) cm3 : 3.50

Spread

1000 s: (5.50)

Remarks:

: CUM #3925266

Start-of-delivery mark 9° cam angle after start of delivery cyl. 1.

Note remarks

Test sheet

: CUM

Edition

: 18.12.92

Replaces

Test oil

: ISO-4113

Combination no. : 0 403 466 131

Injection pump

Pump designation : PES6MW100/120RS1184

EP type number

: 0 413 406 171

Governor

Governor design.

: RSV375...1250MW2A334

Governer no.

: 0 420 085 207

Customer

Customer-spec, information : CUMMINS

Engine

: 6 BTA 5.9

1st version kW

: 140.0

Rated speed

: 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 101

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 3.50...3.60

: (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1250

Rack travel in mm : 10.30...10.40

Del.quantity cm3/: 11.0...11.2

100 s: (10.8...11.4)

cm3 : 0.3

100 s: (0.6)

2nd speed

rpm : 375.0

Rack travel in mm : 6.8...7.3 Del.quantity cm3/: 1.6...2.0

100 s: (1.3...2.2)

Spread

Spread

cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

rpm : 800

Speed Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting \bar{x} : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1250

Aneroid pressure h: 800 Del.quantity

: 110.0...112.0 : (108.0...114.0)

Spread

cm3 : 3.50

1000 : (6.00)

1000

RATED SPEED

1st version

Control lever

position degrees: 110...118

Setting point:

Speed rpm : 800 Rack travel in mm: 0.6

Testing:

1st rack travel in: 9.30

Speed rpm : 1295...1305

2nd rack travel in: 4.00

Speed rpm : 1365...1395 3rd rack travel in: 4.00

Speed rpm : 1420...1450 4th rack travel in: 1550

rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 80...88

Setting point w/out bumper spring

Speed rpm : 375

Rack travel in mm : 6.5

Testing:

Speed rpm : 100

Minimum rack trave: 19.00

rpm : 375

Rack travel in mm : 6.30...6.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed man

: 500 hPa : 800

Pressure

Rack travel mm : 10.30...10.40

Measurement

Speed

1/min : 500

1st pressure hPa : -

Rack travel in m: 9.80...9.90

2nd pressure hPa : 470

Rack travel in m: 10.00...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/: 89.0...91.0

1000 s: (87.0...93.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.30

Speed rpn:: 1295...1305

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 80.0...90.0 1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 375

Rack travel in mm : 6.80...7.30 Del.quantity cm3/: 16.0...20.0 1000 s: (13.5...22.5)

cm3 : 3.50 Spread

1000 s: (5.50)

Remarks:

: CUM #3281954

Start-of-delivery mark 9° cam angle after start of delivery cyl. 1.

Note remarks

Test sheet

: VOL

Edition

: 03.02.93

Replaces

: 12.92

Test oil

: ISO-4113

Combination no.

: 0 403 476 126

Injection pump

Pump designation : PES6MW100/320RS1132

EP type number

: 0 413 406 124

Governor

Governor design. : RSV300...1050Mw4A352

Governer no.

: 0 420 085 201

Customer

Customer-spec. information

: VME

Engine

: TD 61

1st version kW

: 122.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 457 413 010

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening.

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 2.90...3.00

: (2.85...3.05)

Rack travel in mm : 9.00...12.00

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - *

: 0.50 (0.75)

BASIC SETTING

1st speed

rpm: 1000

Rack travel in mm : 11.10...11.20

Del.quantity cm3/: 9.2...9.4

100 s: (9.0...9.6)

cm3 : 0.3

100 s: (0.6)

rpm : 300.02nd speed

Rack travel in mm: 6.0...6.2

Del.quantity cm3/: 1.2...1.6

100 s: (0.9...1.8)

Spread

Spread

cm3 : 0.3100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.20

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1000

Aneroid pressure h: 1000

Del.quantity

: 92.0...94.0 1000 : (90.0...96.0)

Spread

cm3 : 3.50 1000 : (6.00)

RATED SPEED

1st version

Control lever

position degrees: 116...124

Setting point:

Speed

rpm : 800

Rack travel in mm: 0.6

Testina:

1st rack travel in: 10.10

G23

: 1070...1080 rpn 2nd rack travel in: 4.00 rpm : 1110...1140 Speed 3rd rack travel in: 4.00 Speed rpm : 1120,..1150 4th rack travel in: 1250 rpm : 0.30...1.70 LOW IDLE 1

Control lever position degrees: 76...84 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 5.6

Testing: Speed rpm : 100 Minimum rack trave: 19.00 rpm : 300 Rack travel in mm : 5.50...5.70

Aneroid/Altitude Compensator Test

1st version Setting Speed : 1000 rpm Pressure hPa : 1000

Rack travel mm : 11.10...11.20

Measurement 1/min: 1000 Speed

1st pressure hPa : -Rack travel in m: 10.00...10.10 2nd pressure hPa : 100

Rack travel in m: 10.30...10.40

3rd pressure hPa : 160

Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version Ameroid pressure h: rpm : 1000 Del.quantity cm3/ : 77.0...79.0 1000 s: (75.0...81.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 100.0...110.0

1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.00...6.20 Del.quantity cm3/: 12.0...16.0

1000 s: (9.5...18.5)

:

cm3 : 3.50Spread 1000 s: (5.50)

Remarks:

G24

Note inst. in remarks column

Test scheet : FOR 2.5 L Edition : 16.02.93 : 23.11.91 replaces Calibrating oil : ISO-4113

Injection pump : VE4/11F2100R415 : 0 450 414 083 Type number

Customer Part-No. :

Customer-specific information Customer : FORD

Engine : 2.5L DI MY 92

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil • 0 return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating rozzle-holder

: 1 688 901 114 assembly

Openina :

Pressure bar: 207.00...210.00

Perforated-plate

diameter mm: 0.4

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 450

Start of delivery block Piston stroke

mm: 0.35 mm: 0.30...0.40

Outlet: : B

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250

Setting value mm: 4.20...4.60

Shutoff electromagnet voit: 12

Supply-pump pressure

1/min: 500 Speed

Setting value bar: 4.40...5.00

Shutoff

electromagnet Volt: 12

Full-load del. w/out charge press.:

1/min: 1000 Speed

Del. quantity cm3/

1000s.: 32.20...33.20

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 3.0 1000s.: (4.0)

Low-idle speed regulation

Speed 1/min: 425

Del. quantity cm3/ 1000s.; 6.00...8.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 3.0 1000s.: (4.0)

Full-load speed regulation

1/min: 2100

Del. quantity cm3/

1000s.: 30.50...36.50

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 100

Del. quantity cm3/: 50.00...90.00

mind 1000s.: 50.00

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 2000

TD travel mm: 7.50...8.30

mm: (7.20...8.60)

electromagnet Volt: 12 2nd speed 1/min: 1250

TD travel mm: 4.20...4.60

mm: (3.90...4.90)

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 800	+ Shutoff
TD travel mm: 2.002.80	+ electromagnet Volt: 12
mm: (1.703.10)	Del. quantity cm3/: 23.2025.20
Shutoff	10008.: (19.2029.20)
electromagnet Volt: 12	4th speed 1/min: 2100
Q	Shutoff
Supply-pump pressure characteristic:	electromagnet Volt: 12
	Del. quantity cm3/: 30.5036.50
1st speed 1/min: 500	1000s.: (27.5039.50)
Supply-pump	† 5th speed 1/min: 1700
pressure bar: 4.405.00	+ Shutoff
bar: (4.205.20)	- electromagnet Volt: 12
Shutoff	- Del. quantity cm3/: 36.5038.90
electromagnet volt: 12	1000\$.: (35.2040.30)
2nd speed 1/min: 1000	+ 6th speed 1/min: 1000
Supply-pump	+ Shutoff
pressure bar: 5.706.30 bar: (5.506.50)	electromagnet Volt: 12
Shutoff	+ Del. quantity cm3/: 32.2033.20 E + 1000\$:: (30.2035.20)
electromagnet Volt: 12	
3rd speed 1/min: 1250	+ 7th speed 1/min: 500 + Shutoff
Supply—pump	+ electromagnet volt: 12
pressure ban: 6.206.80	+ Del. quantity cm3/: 24.0028.00 F
bar: (6.007.00)	10008.: (23.2029.00)
Shutoff	1,0003 (23.2027.037
electromagnet Volt: 12	Mech. shutoff:
4th speed 1/min: 2000	
Supply-pump	- Electr. shutoff:
pressure bar: 7.808.40	+
bar: (7.608.60)	+ 1st speed 1/min: 425
Shutoff	- Del. quantity cm3/: 0.003.00
electromagnet Volt: 12	1000s.; (0.003.00)
	+ Shutoff
Overlow quantity at overflow valve:	+ electromagnet volt: -
4-t	†
1st speed 1/min: 500	Idle delivery:
Shutoff electromagnet Volt: 12	1.4
0verflow : 97.00141.00	+ 1st speed 1/min: 425 + Shutoff
quantity cm3/10s: (97.00141.00)	
2nd speed 1/min: 1950	electromagnet Volt: 12 bel. quantity cm3/: 6.008.00
Shutoff	10005:: (3.0011.00)
electromagnet Volt: 12	Dispersion 'cm3/: 3.0
Overflow : 115.00184.00	10005.: (4.0)
quantity cm3/10s; (115.00184.00)	- 2nd speed 1/min: 500
•	+ Shutoff
Delivery-quant. and breakaway char.:	electromagnet Volt: 12
·	+ Del. quantity cm3/: 2.0010.00
	+ 1000s.: (0.0010.00)
1nd speed 1/min: 1950	+
Shutoff	+ Part-load del.at 3rd injqty.
electromagnet Volt: 12	terza fermo della portata
Del. quantity cm3/; 36.0038.40	+ stop (EGR set)
1000\$.: (34.7039.70)	+ scarico) (ARF)
2nd speed 1/min: 2400	gaz d'échappement-ARF)
Shutoff	+ Spacing mm: 20.0
electromagnet Volt: 12 Del. quantity cm3/: 0.005.00	1 1-t speed 1/min. 1250
ver. quantity this u.uu	
1000s • 70 00 5 001	1st speed 1/min: 1250
1000S.: (0.005.00) 3rd speed	Shutoff - electromagnet Volt: 12

Del. quantity cm3/: 17.00...20.00 1000s.: (16.00...21.00) Always pay attention to test instructions for DISTRIBUTOR-TYPE Automatic starting fuel delivery: 1/min: 300 1st speed Shutoff pump: electromagnet Volt: 12 Del. quantity cm3/: 35.00...65.00 1000s.: (35.00...65.00) 2nd speed 1/min: 480 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 21.00...31.00 1000s.: (21.00...31.00) 3rd speed 1/min: 100 Shutoff electromagnet Volt: 12 Del. duantity cm3/: 50.00...90.00 1000s.: (50.00...90.00) Shutoff electromagnet: Cut-in speed 1/min min voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation speed 1/min K mm: 2.7...2.9 KF mm: KOT MS mm: 1.8 mm: --XΚ XL. mm: speed 1/min Remarks: speed 1/min Overflow restriction 0.75 mm - Part No. ..343,..344

INJECTION PUMPS FOR DI ENGINES! Information additionally required for testing fuel-injection TEST PREREQUISITES Calibrating-oil return temperature with thermometer, °C :45 Calibrating-oil inlet temperature, °C :35...40 Dwell speed, 1/min :1100 Feedback voltage, mv SETTINGS/TEST SPECIFICATIONS FOR FUEL-INJECTION PUMP, delivery rates Test speed, 1/min :<500 Temperature stabilisation :2200 Output temperature, °C :51 Measurement temperature, °C:49 Test speed, 1/min :500...799 Temperature stabilisation :220G Output temperature, °C :48 Measurement temperature, °C:46 :800...1199 Test speed, 1/min Temperature stabilisation :2200/100 Output temperature, °C Measurement temperature, °C:45 :1200...1700 Test speed, 1/min Temperature stabilisation :100 Output temperature, °C :42 Measurement temperature, °C:44 Test speed, 1/min : 1700 Temperature stabilisation speed 1/min :100 Output temperature, °C :41 Measurement temperature, °C:43

Pump/engine assignment: Attach timing-device cover KDEP 1151. Plunger lift in blocking position = 0.30... 0.40 mm referenced to outlet "B".

Note inst. in remarks column

Test scheet

Edition : 15.02.93

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/11F1900R514

Type number : 0 460 414 100

Customer Part-No. :

Customer-specific information

Customer

: IVECO-SOFIM

Engine

: 8142.47.1811

Power

KW: 85

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil **°**C return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 027 assembly

Opening

bar: 250.00...253.00 Pressure

Perforated-plate

diameter

mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00

x Length mm: 450

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250 Charge press. hPa: 1000

Setting value mm: 2.00...2.40

Shutoff

electromagnet Volt: 24

Supply-pump pressure

1/min: 1250 Charge press hPa: 1000

Setting value bar: 5.30...5.90

Shutoff

electromagnet Volt: 24

Full-load del. with charge press.:

Speed 1/min: 1750 Charge press. hPa: 1000

Del. quantity cm3/

1000s.: 58.00...59.00

Shutoff

electromagnet Volt: 24 Dispersion cm3/: 4.0

1000s.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 550

Del. quantity cm3/

1000s.: 25.00...26.00

Shutoff

electromagnet Volt: 24

Low-idle speed regulation

1/min: 325 Speed

Del. quantity cm3/

1000\$... 10.00...14.00

Shutoff

electromagnet Volt: 24 Del. quantity cm3/: 6.0

1000s.: (6.5)

Full-load speed regulation

Speed 1/min: 2100 Charge press hPa: 1000

Del. quantity cm3/

1000s.: 22.00...28.00

Shutoff

electromagnet Volt: 24

Start:

1/min: 100 Speed

Del. quantity cm3/: 40.00...90.00

1000s.: 40.00 mind

Shutoff

electromagnet Volt: 24

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

Speed 1/min: 1250

Charge press hPa: 1000

Injaty. cm3/		+	Supply-pump	
difference 1000s.:	- 28 O 3O O #	1		7.608.20
Shutoff	20.000.0	1	Shutoff	7.000.20
electromagnet Volt:	2/4	T.	electromagnet Volt:	2/.
SP press.—dif.measu		Ţ	etectionagnet vott.	24
pompa di mandata (Fl	o'i	T	0	
1. Speed 1/min:	1250	Ť	Overlow quantity at	overtiow valve:
		†	4	000
Charge press hPa:	1000	+	1st speed 1/min:	
Supply pump		+	Charge press. hPa:	1000
pressure		+	Shutoff	
difference bar:	- 0.10.3 #	+	electromagnet Volt:	24
Shutoff		+	Overflow:	75.00119.50
electromagnet Volt:	24.0	4	quantity cm3/10s:	(60.00134.50)
_		+	2nd speed 1/min:	
Inspection pump tes	t specifications	1	Charge press. hPa:	
Test specifications		\perp	Shutoff	1500
	* The partition of the	1	electromagnet Volt:	2/.
Timing device charac	rtonictic.	T	Overflagner vott:	64 70 400 70
mining device charac	iteristic.	T	Overflow :	77.30(00.70
2nd annual 1/	1500	+	quantity cm3/10s:	(82.30195.70)
2nd speed 1/min:		+		
Charge press hPa:		+	Delivery-quant. and	breakaway char.:
	3.604.40	+		•
	(3.304.70)	+		
Shutoff		+	1nd speed 1/min:	800
electromagnet Volt:	24	+	Charge-air pressure	-settina
3rd speed 1/min:		1	point hPa:	400
Charge press hPa:		1	LDA-stroke mm:	
TO travel mm:	2.002.40	L	Shutoff	0.1
	(1.502.90)	T		27.
Shutoff	(1.302.70)	T	electromagnet Volt:	/7 00 // 00
	7/	†	Del. quantity cm3/:	43.0044.00
electromagnet Volt:		†		(39.5047.50)
4th speed 1/min:		†	2nd speed 1/min:	
Charge press hPa:		+	Charge press. hPa:	1000
TD travel mm:		+	Shutoff	
	(0.001.30)	+	electromagnet Volt:	24
Shutoff		+	Del. quantity cm3/:	0.003.00
electromagnet volt:	24	+		(0.003.00)
5th speed 1/min:		1	5th speed 1/min:	
Charge press. hPa:		1	Charge press. hPa:	
	4.505.30	1	Shutoff	1000
	(4.205.60)	1	electromagnet Volt:	2/.
Shutoff	(4.605.00)	T	Del. quantity cm3/:	
electromagnet Volt:	2/	T		
etectionagnet vott.	24	T		(20.5029.50)
Standay management		Ť	8th speed 1/min:	
Supply—pump pressure	e characteristic:	+	Charge press. hPa:	1000
	***	†	Shutoff	
1st speed 1/min:		+	electromagnet Volt:	
Charge press. hPa:	1000	+	Del. quantity cm3/:	41.0049.00
Supply-pump		1	1000s.:	(39.0051.00)
pressure bar:	3.604.20	+	9th speed 1/min:	1900
Shutoff		+	Charge press. hPa:	
electromagnet Volt:	24	1	Shutoff	
2nd speed 1/min:		1	electromagnet Volt:	24
Charge press. hPa:		1	Del. quantity cm3/:	
Supply—pump	. 555	1		(57.0064.00)
	5.305.90	T		
Shutoff	J.JU.,.J.7U	T	12th speed 1/min:	
	27.	T	Charge press. hPa:	I UUU
electromagnet Volt:		†	Shutoff	24
3rd speed 1/min:		+	electromagnet Volt:	24
Charge press. hPa:	PUUU	+		

Del. quyntity cm3/: 58.00...59.00 1000s.: (55.00...62.00) TD-travel dif.measurement: correttore anticipo iniezione (SV): 1st speed 1/min: 1250 1/min: 1250 15th speed Charge press. hPa: 1000 Charge press. hPa: 1000 Shutoff TD-travel : -0.7...0.9 " mm: difference Shutoff electromagnet Volt: 24 2nd speed 1/min: 1250 Charge press. hPa: -Charge press. hPa: 1000 Shutoff : - 0.6...1.4 ' TD-travel electromagnet Volt: 24 Del. quantity cm3/: 25.00...26.00 1000s.: (22.00...29.00) difference mm: -Automatic starting fuel delivery: 1/min: 800 20th speed Charge press. hPa: 1000 1st speed 1/min: 200 Shutoff Shutoff electromagnet Volt: 24 electromagnet Volt: 24 Del. quantity cm3/: 49.50...58.50 Del. quantity cm3/: 55.00...105.00 1000S.: (55.00...105.00) 1000s.: (48.50...59.50) Mech. shutoff: 2nd speed 1/min: 500 Shutoff electromagnet Volt: 24 Del. quantity cm3/: 14.00...30.00 Electr. shutoff: 1st speed 1/min: 325 1000s.: (14.00...30.00) Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) 4th speed 1/min: 100 Shutoff Shutoff electromagnet Volt: 24 electromagnet volt: -Del. quantity cm3/: 40.00...90.00 1000s.: (40.00...90.00) Idle delivery: 1st speed 1/min: 325 Shutoff electromagnet: Shutoff electromagnet Volt: 24 Cut-in Del. quantity cm3/: 10.00...14.00 1000S.: (8.00...16.00) min voltage : 20.0 Rated voltage : 24.0 Dispersion cm3/: 6.01000s.: (6.5) Remarks: 2nd speed 1/min: 450 Shutoff electromagnet Volt: 24 Operate control lever after each Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) manifold-pressure compensator pressure change. Load-dependent start of delivery: * Correction at adjusting nut Inj.-qty.dif.measurement: 1st speed 1/min: 1250 Charge press. hPa: 1000 Inj.-qty. cm3/ : - 27.0..35.0" difference 1000s.: -Shutoff electromagnet Volt: 24 2nd speed 1/min: 1250 Charge press. hPa: 1000 Inj.-qty. cm3/: MAX: difference 1000s.: 2.00...8.00

Always pay attention to test instructions for DISTRIBUTOR-TYPE INJECTION PUMPS FOR DI ENGINES! Information additionally required for testing fuel-injection pump: TEST PREREQUISITES Calibrating-oil return temperature with thermometer, °C Calibrating-oil inlet :35...40 temperature, °C Dwell speed, 1/min :1100 Feedback voltage, mV SETTINGS/TEST SPECIFICATIONS FOR FUEL-INJECTION PUMP, delivery rates Test speed, 1/min :<500 Temperature stabilisation speed 1/min :2100 Output temperature, °C :51 Measurement temperature, °C:49 Test speed, 1/min :500...799 Temperature stabilisation speed 1/min :2100 Output temperature, °C :48 Measurement temperature, °C:46 Test speed, 1/min :800...1199 Temperature stabilisation speed 1/min :2100/100 Output temperature, °C Measurement temperature, °C:45 Test speed, 1/min :1200...1700 Temperature stabilisation speed 1/min :100 Output temperature, °C :42 Measurement temperature, °C:44 Test speed, 1/min : 1700 Temperature stabilisation speed 1/min :100 Output temperature, °C

Measurement temperature, °C:43

Note inst. in remarks column

: MAN 7.2 P Test scheet Edition : 15.02.93 : 23.07.91 replaces Calibrating oil : ISO-4113

Injection pump : VE6/11F1350R417 Type number : 0 460 416 068

Customer Part-No. :

Customer-specific information

Customer

' : D 0826 F01/0H Engine

TEST BENCH REQUIREMENTS

Calibrating oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 109

Openina |

Pressure bar: 207.00...210.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 840 x Length

Start of delivery

Prestroke mm: 0.3

(from BDC): +-0.02(0.04)

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 800

Setting value mm: 3.80...4.20

Supply-pump pressure

1/min: 800

Setting value bar: 5.00...5.60

Full-load del. with charge press.:

cm3/: 4.0Dispersion 1000s.: (4.5)

Full-load del. w/out charge press.:

Speed 1/min: 1000

Del. quantity cm3/

1000s.: 75.70...76.70

cm3/: 4.0Dispersion 1000s.: (4.5)

Low-idle speed regulation

1/min: 300 Del. quantity cm3/

1000s.: 7.00...13.00

Del. quantity cm3/: 6.0 1000s.: (6.5)

Full-load speed regulation

Speed 1/min: 1410

Del. quantity cm3/

1000s.: 57.60...63.00

Start:

1/min: 100 Speed

Del. quantity cm3/: 40.00...80.00

1000s.: 40.00

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1350

mm: 6.10...6.90 mm: (5.80...7.20) TD travel

1/min: 800 3rd speed

TD travel mm: 3.80...4.20

mm: (3.30...4.70)

4th speed 1/min: 600

TD travel mm: 2.50...3.30

mm: (2.20...3.60)

1/min: 1000 6th speed

TD travel mm: 4.40...5.20 mm: (4.10...5.50)

Supply-pump pressure characteristic:

1/min: 600 1st speed

Supply-pump

pressure bar: 4.20...4.80

1/min: 800 2nd speed

Supply-pump

bar: 5.00...5.60 1/min: 1350 pressure

3rd speed

Supply-pump bar: 7.00...7.60 pressure 1/min: 1000 4th speed Supply-pump pressure bar: 5.80...6.40 Overlow quantity at overflow valve: 1st speed 1/min: 600 ; 41.70...83.40 Overflow quantity cm3/10s: (26.70...98.40) 1/min: 1350 2nd speed Overflow : 55.60...139.00 cm3/10s: (40.60...153.00) quantity Delivery-quant. and breakaway char.: 1/min: 1550 2nd speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) 1/min: 1500 3rd speed Del. quantity cm3/: 0.00...15.00 1000S.: (0.00...15.00) 4th speed 1/min: 1450 Del. quantity cm3/: 15.00...45.00 1000s.: (15.00...45.00) 1/min: 1410 5th speed Del. quantity cm3/: 57.00...63.00 1000s.: (55.50...64.50) 9th speed 1/min: 1350 Del. quantity cm3/: 75.20...78.20 1000S.: (73.70...79.70) 11th speed 1/min: 800 Del. quantity cm3/: 74.20...78.20 1000S.: (72.70...79.70) 12th speed 1/min: 1000 Del. quyntity cm3/: 75.70...76.70 1000s.: (73.70...78.70) 20th speed 1/min: 600 Del. quantity cm3/: 58.50...64.50 1000s.: (57.50...65.50) Mech. shutoff: Mech. Abstellung: 1/min: 1350 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Idle delivery: 1st speed 1/min: 300 Del. quantity cm3/: 7.00...13.00 1000s.: (5.00...15.00) cm3/: 6.0 Dispersion 1000s.: (6.5) 1/min: 450 2nd speed

Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Automatic starting fuel delivery: 1/min: 350 1st speed Del. quantity cm3/: 60.00...120.00 1000s.: (60.00...120.00) 2nd speed 1/min: 500 Del. quantity cm3/: 40.00...70.00 1000s.: (40.00...70.00) 4th speed 1/min: 100 Del. quantity cm3/: 40.00...80.00 1**000**\$.: (40.09...80.00) Shutoff electromagnet: Cut-in min voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation K mm: -KF mm: K-OT MS mm: 1.0...1.4 SVS max. mm: 3,7 Remarks:

Note inst. in remarks column

Test scheet

Edition : 12.02.93

replaces

Calibrating oil : ISO-4113

Injection pump : VE6/12F1950L448

: 0 460 426 193 Type number

Customer Part-No. :

Customer-specific information

Customer

: PENTA

Engine

: TD 42A

Power

KW: 170

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 344

Calibrating-oil

return temo.

with thermometer : 40.00...48.00 Electronically: 42.00...50.00

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening

bar: 130.00...133.00 Pressure

Test inj. tubing : 1 680 901 073

Outside diameter : 6.00

x Wall thickness : 2.00

x Length

mm: 450

Start of delivery

Prestroke mm: 0.3

(from BDC); +-0.02(0.04)

Injection pump setting values

Test specifications in parentheses

Timing-device travel

1/min: 1500 Speed Charge press. hPa: 1500

Setting value mm: 2.40...2.80

Supply-pump pressure

Speed 1/min: 1500 Charge press hPa: 1500

Setting value bar: 7.7...8.3

Full-load del. with charge press.:

1/min: 1800 Charge press. hPa: 1500

Del. quantity cm3/ 1000S.: 130.7...131,7 Dispersion cm3/: 5.0

Full-load del. w/out charge press.:

Speed 1/min: 600

Del. quantity cm3/

1000s.: 58,50...59.50

Low-idle speed regulation

Speed 1/min: 400

Del. quantity cm3/

1000s.: 17.00...21.00

Del. quantity cm3/: 5.0

1000s.: -

Full-load speed regulation

1/min: 2150 Speed Charge press hPa: 800

Del. quantity cm3/

1000s.: 24.00...30.00

Start:

1/min: 100

Del. quantity cm3/: 80.00...140.00 mind 1000s.: 80.00

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1100

hPa: 1500 Charge press

TD travel mm: 0.60...1.60 mm: (0.40...1.80)

2nd speed

1/min: 1500 hPa: 1500 mm: 2.40...2.80 Charge press TD travel

mm: (2.10...3.10)

1/min: 1900 3rd speed

hPa: 1500 Charge press TD travel mm: 4.10...4.90

mm: (3.80...5.20)

Supply-pump pressure characteristic:

1st speed 1/min: Charge press. hPa: Supply-pump pressure bar: 2nd speed 1/min: Charge press. hPa: Supply-pump pressure bar: 3rd speed 1/min: Charge press. hPa: Supply-pump pressure bar: 4th speed 1/min: Charge press. hPa: Supply-pump pressure bar: 4th speed 1/min: Charge press. hPa: Supply-pump pressure bar: Overlow quantity at	4.805.40 1100 1500 6.507.10 1500 1500 7.708.30 1900 1500 8.809.40	╺╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸╏╸ ╋	8th speed 1/min: Charge press. hPa: Del. quantity cm3/: 1000S.: 9th speed 1/min: Charge press. hPa: Del. quantity cm3/: 1000S.: 10th speed 1/min: Charge press. hPa: Del. quantity cm3/: 1000S.: 11th speed 1/min: Charge press. hPa: Del. quantity cm3/: 1000S.: 11th speed 1/min: Charge press. hPa: Del. quantity cm3/:	(134.00141.00) 1100 1500 84.5088.50 (83.0090.00) 900 1500 123.50128.50 (122.50129.50) 600 1500 117.00121.00 (115.00123.00) 600
•		+		, , , , , , , , , , , , , , , , , ,
1st speed 1/min: Charge press. hPa: Overflow : quantity cm3/10s: 2nd speed 1/min: Charge press. hPa: Overflow : quantity cm3/10s:	1500 75.00119.40 (60.00134.40) 1950 1500 97.20180.50	1-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+	Mech. shutoff: Mech. Abstellung: 1st speed 1/min: Charge press. hPa: Del. quantity cm3/: 1000S.: Electr. shutoff:	1500 0.003.00
Delivery-quant. and	breakaway char.:	‡	1st speed 1/min:	400
1nd speed 1/min: Charge-air pressure- point hPa: LDA-stroke mm: Del. quantity cm3/: 1000S.: 2nd speed 1/min:	-setting 700* 7.5 89.5090.50 (84.0096.00)	+++++++++++++++++++++++++++++++++++++++	Charge press. hPa: Del. quantity cm3/: 1000S.: Shutoff electromagnet volt: Idle delivery:	0.003.00
Charge press. hPa:		+	1st speed 1/min:	400
Del. quantity cm3/: 1000S.: 3rd speed 1/min:	0.003.00	+	Del. quantity cm3/:	17.0021.00 (15.0023.00)
Charge press. hPa:		1	1000s.:	
Del. quantity cm3/:	24.0030.00 (21.0033.00) 2050	+++++++++++++++++++++++++++++++++++++++	2nd speed 1/min: Del. quantity cm3/: 1000S.: 3rd speed 1/min:	550 0.03.0 -
Del. quantity cm3/: 1000S:	101.00115.00 (94.00122.00)	+	Del. quantity cm3/:	
5th speed 1/min:		1	.0003.1	(4.0014.00)
Charge press. hPa:		1	Automatic starting f	fuel delivery:
Del. quantity cm3/:	124.00128.00	+		•
6th speed 1/min: Charge press. hPa:	1500	+	1st speed 1/min: Del. quantity cm3/: 1000s.:	60.0090.00
Del. quantity cm3/:		+	2nd annual 1/min	100
7th speed 1/min: Charge press. hPa:		<u> </u>	2nd speed 1/min: Del. quantity cm3/: 1000S.:	80.00140.00
		ī		

Shutoff electromagnet:

Cut-in

min voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

Remarks:

Pushing electromagnet.

Operate control lever after each manifold-pressure compensator pressure change.

* Correction at adjusting nut

Note inst. in remarks column

Test scheet : MAN

Edition : 15.02.93

replaces

Calibrating oil : ISO-4113

Injection pump : vE6/12F1200R496

Type number : 0 460 426 209

Customer Part-No. :

Customer-specific information

Customer

Engine : D 0826 LF 07

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 110

Openina |

bar: 250.00...253.00 Pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00

x Wall thickness : 2.00 x Length mm: 840

Start of delivery

Prestroke mm: 0.2

(from BDC): +-0.02(0.04)

Injection-pump setting values

Test specifications in parentheses

Timing-device travel

1/min: 850 Speed

Charge press. hPa: 1000

Setting value mm: 2.00...2.40

Supply-pump pressure

Speed 1/min: 850

Charge press hPa: 1000 Setting value bar: 7.30...7.90

Full-load del. with charge press.:

1/min: 1000 Charge press. hPa: 1000

Del. quantity cm3/

1000s.: 93.50...94.50 cm3/: 4.0

Dispersion

1000s.: (4.5)

Full-load del. w/out charge press.:

1/min: 500 Speed

Del. quantity cm3/

1000s.: 59.50...60.50

low-idle speed regulation

Speed 1/min: 250

Del. quantity cm3/ 1000S.: 16.50...23.50

Del. quantity cm3/: 6.0 1000s.: (6.5)

Full-load speed regulation

1/min: 1280 Charge press hPa: 1000

Del. quantity cm3/

1000s.: 62.00...68.00

Start:

1/min: 100 Speed

Del. quantity cm3/: 60.00...100.00

mind 1000s.: 60.00

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 950

Charge press

hPa: 1000 mm: 2.90...3.70 TD travel

mm: (2.60...4.00)

1/min: 850 3rd speed hPa: 1000 Charge press

mm: 2.00...2.40 TD travel mm: (1.50...2.90)

4th speed 1/min: 750

Charge press hPa: 1000

mm: 0.60...1.40 TD travel mm: (0.30...1.70)

Supply-pump pressure characteristic:

H10

	1 00 00 07 00
1st speed 1/min: 500	+ Del. quantity cm3/: 92.9097.90 + 1000S.: (91.4099.40)
Charge press. hPa: 1000	17th speed 1/min: 600
Supply-pump	Charge press. hPa: 1000
pressure bar: 5.506.10 2nd speed 1/min: 850	Del. quantity cm3/: 98.60103.60
2nd speed 1/min: 850	1000H.: (97.10105.10)
Charge press. hPa: 1000	+ 18th speed 1/min: 500
Supply-pump	+ Charge press. hPa: -
pressure bar: 7.307.90	+ Del. quantity cm3/: 59.5060.50
3rd speed 1/min: 1200	1000\$.: (57.5062.50)
Charge press. hPa; 1000 Supply—pump	20th speed 1/min: 500
pressure bar: 9.009.60	Charge press. hPa: 1000 Del. quantity cm3/: 102.40111.40
pressure bar. 7.00,,,7.00	1000S.: (100.90112.90)
Overlow quantity at overflow valve:	10003 (100,78112.707
,,,,,,,,	+ Mech. shutoff:
1st speed 1/min: 500	+ Mech. Abstellung:
Overflow : 41.7083.40	+
quantity cm3/10s: (26.7098.40)	1st speed 1/min: 1200
2nd speed 1/min: 1200	+ Charge press. hPa: 1000
Charge press. hPa: 1000	bel. quantity cm3/: 0.003.00
Overflow : 55.60139.00 quantity cm3/10s: (40.60154.00)	1000s.: (0.00,3.00)
quartery (ms/105; (40.00,154.00)	+ Shutoff
Delivery quant. and breakaway char.:	+ electromagnet volt: -
be cirely against and bi conducty chart.	Idle delivery:
	Tate detivery.
1nd speed 1/min: 500	1st speed 1/min: 250
Charge-air pressure-setting	+ Del. quantity cm3/: 16.5023.50
point hPa: 450	† 1000s.: (14.5025.50)
LDA-stroke mm: 7.5	+ Dispersion cm3/: 6.0
Del. quantity cm3/: 92.5093.50	10005.: (6.5)
1000s.: (90.5095.50) 2nd speed 1/min: 1450	2nd speed 1/min: 400
Charge press. hPa: 1000	Del. quantity cm3/: 0.003.00 + 1000s.: (0.003.00)
Del. quantity cm3/: 0.003.00	1 10005.: (0.005.00)
1000s.: (0.003.00)	Automatic starting fuel delivery:
3rd speed 1/min: 1350	Additional to Starting Tool decivery.
Charge press. hPa: 1000	1st speed 1/min: 330
Del. quantity_cm3/: 0.0015.00	bel. quantity cm3/: 70.00100.00
1000s.: (0.00,15.00)	1000s.: (70.00100.00)
4th speed 1/min: 1300	+
Charge press. hPa: 1000	2nd speed 1/min: 430
Del. quantity cm3/: 15.0055.00 1000s.: (15.0055.00)	Del. quantity cm3/: 40.0070.00
5th speed 1/min: 1280	1000s.: (40.0070.00)
Charge press. hPa: 1000	4th speed 1/min: 100
Del. quantity cm3/: 62.0068.00	Del. quantity cm3/: 60.00100.00
1000s.: (60.5069.50)	10005.: (60.00100.00)
9th speed 1/min: 1200	+
Charge press. hPa: 1000	+ Mounting and assembly dimensions:
Del. quantity cm3/: 88.2093.20	+
1000s.: (86.7094.70)	+ Designation
12th speed 1/min: 1000	+ K mm: -
Charge press. hPa: 1000	+ KF mm: K-OT + MS mm: 0.91.3
Del. quyntity cm3/: ^3.5094.50 1000s.: (91.5096.50)	+ MS
15th speed 1/min: 800	LUM SLIUKE (IIII; 7.3
Charge press. hPa: 1000	Remarks:
J. J. 1221 - 111 44 1 444	:
	•

Operate control lever after each manifold—pressure compensator pressure change.

* Correction at adjusting nut

Note inst. in remarks column

Test scheet : REN

Edition : 15.02.93

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/8F2300R317-6

Type number : 0 460 484 061

Customer Part-No. :

Customer-specific information

Customer

: RENAULT

Engine

: F8Q - 706 CA

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil

°C return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 022 assembly

Opening |

bar: 127.00...130.00 Pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00

x Wall thickness : 2.00

x Length

mm: 450

Start of delivery

Prestroke mm: -

(from BDC): -

Injection-pump setting values

Test specifications in parentheses

Timing-device travel

1/min: 1250 Speed

Setting value mm: 3.20...3.60

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 1250

Setting value bar: 4.40...5.00

Shutoff

electromagnet Volt: 12

Full-load del. w/out charge press.:

1/min: 1250

Del. quantity cm3/

1000s.: 31.60...32.60

Shutoff

electromagnet Volt: 12.0

Dispersion cm3/: 2.5

1000s.: (3.0)

Low-idle speed regulation

Speed 1/min: 410

Del. quantity cm3/

1000s.: 7.5...11.5

Shutoff

electromagnet Volt: 12.0

Del. quantity cm3/: 2.5 1000s.: (3.0)

Residual-Delivery Setting

Speed 1/min: 500

Del. quantity cm3/

1000s.: 1.00...5.00

Shutoff

electromagnet Volt: 12

Full-load speed regulation

1/min: 2450 Speed

Del. quantity cm3/

1000s.: 23.00...29.00

Shutoff

electromagnet Volt: 12.0

Start:

1/min: 100 Speed

Del. quantity cm3/: 40.00...70.00

1000s.: 40.00

Shutoff

electromagnet Volt: 12

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

1/min: 1250 Speed

cm3/Inj.-qty.

difference 1000s.: - 10.5..12.5 #

Shutoff

electromagnet Volt: 12

SP press. -dif.measurement pompa di mandata (FP)

1/min: 1250 1.Speed

Supply pump pressure 1st speed 1/min: 750 difference. bar: -0.1...0.3 #Shutoff Shutoff electromagnet Volt: 12 : 41.70...83.40 electromagnet Volt: 12.0 Overflow cm3/10s: (26.70...98.40) quantity Inspection-pump test specifications 2nd speed 1/min: 2250 Test specifications in parentheses Shutoff electromagnet Volt: 12 Timing-device characteristic: Overflow : 55.60...139.00 quantity cm3/10s: (40.60...154.00) 2nd speed 1/min: 2000 mm: 5.80...6.60 TD travel Delivery-quant. and breakaway char.: mm: (5.50...6.90) Shutoff electromagnet Volt: 12 1/min: 2950 2nd speed 1/min: 1250 mm: 3.20...3.60 mm: (2.70...4.10) 3rd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...5.00 1000s.: (0.00...5.00) TD travel Shutoff electromagnet Volt: 12 4th speed 1/min: 750 1/min: 2650 3rd speed Shutoff mm: 1.10...1.90 TD travel mm: (0.80...2.20) Shutoff electromagnet Volt: 12 1/min: 500 8th speed Shutoff TD travel mm: 2.20...4.60 mm: -KSB/AFB valve Volt: 12 Shutoff Shutoff electromagnet Volt: 12 electromagnet Volt: 12 Del. quantity cm3/: 31.50...33.50 1/min: 310 9th speed TD travel mm: 1.00...3.40 1000s.: (30.20...34.80) mm: -1/min: 2000 10th speed KSB/AFB Shutoff valve Volt: 12 Shutoff electromagnet Volt: 12 Supply-pump pressure characteristic: Shutoff electromagnet Volt: 12 Del. quantity cm3/: 29.70...32.70 1st speed 1/min: 750 1000s.: (28.90...33.50) Supply-pump pressure bar: 3.10...3.70 1/min: 1250 12th speed Shutoff Shutoff electromagnet Volt: 12 electromagnet Volt: 12 Del. quyntity cm3/: 31.00...32.00 1000s.: (29.20...33.80) 20th speed 1/min: 750 1/min: 1250 2nd speed Supply-pump bar: 4.40...5.00 pressure Shutoff Shutoff electromagnet Volt: 12 3rd speed 1/min: 2000 electromagnet Volt: 12 Del. quantity cm3/: 30.10...33.10 Supply-pump 1000s.: (29.30...33.90) pressure bar: 6.30...6.90 Shutoff Mech. shutoff: electromagnet Volt: 12 Electr. shutoff: Overlow quantity at overflow valve:

H14

1st speed 1/min: 410 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Automatic starting fuel delivery: 1/min: 210 1st speed Damper set qty.: Shutoff electromagnet Volt: 12 Del. quantity cm3/: 45.00...75.00 LFG-setting: solidale con carcassa: 1**000s.:** (45.00...75.00) Idle delivery: 2nd speed 1/min: 310 1st speed 1/min: 410 Shutoff Shutoff electromagnet Volt: 12 electromagnet Volt: 12 Del. quantity_cm3/: 7.50...11.50 Del. quantity cm3/: 15.00...45.00 1000s.: (15.00...45.00) 1000s.: (5.50...13.50) 4th speed 1/min: 100 High Idle: Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.00...70.00 1000s.: (40.00...70.00) 1/mi: 500 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 7.00...11.00 Shutoff electromagnet: 1000s.: (5.00...13.00) Cut-in Residual: min voltage : 10.0 Rated voltage : 12.0 1/min: 500 1.Rotacao Shutoff Mounting and assembly dimensions: electromagnet Volt: 12 Del. quantity cm3/: 1.00...5.00 1000s.; (1.00...5.00) Designation mm: 3.2...3.4 Κ KF mm: 5.5 Load-dependent start of delivery: MS mm: 1.1...1.5 Inj.-qty.dif.measurement: mm: 2.0 SVS max. LDA stroke mm: LD =1st speed 1/min: 1250 HBA stroke mm: 7,5...8.5 Inj.-qty. cm3/ : -13.2..17.2 " difference 1000s.: -Remarks: Shutoff : electromagnet Volt: 12 2nd speed 1/min: 1250 Inj.-qty. cm3/: MAX:2.0..8.0' difference 1000s.: -Shutoff electromagnet Volt: 12.0 TD-travel dif.measurement: correttore anticipo iniezione (SV): 1st speed 1/min: 1250 TD-travel : - 0.4..0.6 " difference mm: -Shutoff electromagnet Volt: 12 2nd speed 1/min: 1250 TD-travel : - 0.3..0.70 ' difference mm: -SP press.-dif.measurement: pompa di mandata (FP): 1st speed 1/min: 1250

Note inst. in remarks column

Test scheet : VWW 2.4 S7 Edition : 11.11.92 replaces : 03.02.92 Calibrating oil : ISO-4113

Injection pump : VE5/8F2100L358 Type number : 0 460 485 003

Customer-specific information

Customer

: 153-2.4L.-T4 Engine

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil °C return temp.

with thermometer : 40.00...48.00 : 42.00...50.00 Electronically

Inlet press., bar : 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 000 assembly

Openina |

bar: 147.00...150.0G Pressure

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery Prestroke mm: -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250 Setting value mm: 1.5...1.9 Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 1250 Setting value bar: 5,7...6,3 Shutoff electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1250

Del. quantity cm3/

1000s.: 36,0...37,0

Shutoff

electromagnet Volt: 12 cm3/: 2,0 Dispersion 1000s.: (3.0)

Low-idle speed regulation

1/min: 415 Speed

Del. quantity cm3/

1000s.: 7.00...9.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 2,0

Residual-Delivery Setting

Speed 1/min: 540

Del. quantity cm3/

1000s.: 6,5...7,5

Shutoff

electromagnet Volt: 12

Full-load speed regulation

1/min: 2400

Del. quantity cm3/

1000s.: 10.00...14,00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100

Del. quantity cm3/: 35.00...85.00 mind 1000s.: 35.00

Shutoff

electromagnet Volt: 12

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

1/min: 1500 Speed

cm3/ Inj.-qty.

difference 1000s.: 3.5...9.5 *

Shutoff

electromagnet Volt: 12 TD-travel dif.measurement

correttore anticipo iniezione (SV)

1. Speed 1/min: 1500

TD-travel

difference mm: 0.3...0.5 *

H16

Shutoff Del. quantity cm3/: 0.00...6,00 1000s.: electromagnet Volt: 12 2nd speed 1/min: 2400 Inspection pump test specifications Shutoff Test specifications in parentheses electromagnet Volt: 12 Del. quantity cm3/: 10,00...14,00 1000S.: (8,00...16,00) 3rd speed 1/min: 2300 Timing-device characteristic: 1st speed 1/min: 2100 T0 travel mm: 5,30...6,10 mm: (5.00...6,40) electromagnet Volt: 12 2nd speed 1/min: 1790 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 17,00...27,00 1000s.: (16,00...28,00) 1/min: 2100 4th speed TD travel rm: 4,60...5,40 Shutoff mm: (4,30...5,70)electromagnet Volt: 12 Del. quantity cm3/: 29,50...31,50 Shutoff electromagnet Volt: 12 3rd speed 1/min: 1250 1000s.: (28,30...32,70) 1/min: 1250 5th speed mm: 1,50...1,90 mm: (1,00...2,40) TD travel Shutoff electromagnet Volt: 12
Del. quantity cm3/: 36,00...37,00
10005.: (34,30...38,70) Shutoff electromagnet Volt: 12 1/min: 600 6th speed Supply-pump pressure characteristic: Shutoff electromagnet Volt: 12 Del. quantity cm3/: 32,30...35,30 1/min: 600 1st speed Supply-pump 1**000**S.: (30,80...36,80) pressure bar: 3,80...4,40 Shutoff Mech. shutoff: electromagnet Volt: 12 1/min: 1250 2nd speed Electr. shutoff: Supply-pump pressure bar: 5,70...6,30 1/min: 415 1st speed Snutoff Del. quantity cm3/: 0,00...3,00 electromagnet Volt: 12 3rd speed 1/min: 2100 1000s.: -Shutoff Supply-pump electromagnet volt: pressure bar: 8,10...8,70 Shutoff Idle delivery: electromagnet Volt: 12 1st speed 1/min: 415 Overlow quantity at overflow valve: Shutoff electromagnet Volt: 12 Del. quantity cm3/: 7,00...9,00 1000S.: (4,00...12,00) 1st speed 1/min: 600 Shutoff electromagnet Volt: 12 Overflow : 41,70...83,40 Residual: cm3/10s: (27,80...97,30) 1/min: 2100 quantity 2nd speed 1.Rotacao 1/min: 540 Shutoff Shutoff electromagnet Volt: 12 electromagnet Volt: 12 Del. quantity cm3/: 6,50...7,50 1000s.: (5,00...9,00) 2nd speed 1/min: 490 Overflow : 55,60...138,90 cm3/10s: (41,70...152,90) quantity 2nd speed Delivery-quant. and breakaway char .: Shutoff electromagnet Volt: 12 Del. quantity cm3/: 6,80...8,80 10008:: (5,30...10,30) 1nd speed 1/min: 2600 Shutoff electromagnet Volt: 12 Load-dependent start of delivery:

H17

Inj.-qty.dif.measurement: 1/min: 1500 1st speed Inj.-qty. cm3/ : MAX. ..3,00 # difference 1000s.: -Shutoff electromagnet Voit: 12 TD-travel dif.measurement: correttore anticipo iniezione (SV): 1st speed 1/min: 1500 TD-travel : 0,90...1,30 # mm: (0,50...1,70)difference Shutof:f electromagnet Volt: 12 SP press.-dif.measurement: pompa di mandata (FP): 1st speed 1/min: 1500 Supply pumppressure : 0,80...1,20 difference bar: -Shutoff electromagnet Volt: 12 Automatic starting fuel delivery: 1/min: 180 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 35,00...85,00 1000s.: -2nd speed 1/min: 380 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 17,00...37,00 1000s.: -3rd speed 1/min: 100 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 35,00...85,00 1000s.: -Shutoff electromagnet: Cut-in min voltage : 10,0 Rated voltage : 12,0

Mounting and assembly dimensions:

mm: 3,2...3,4

mm: K-OT mm: 1,2...1,6

mm: 2,4

Designation

K KF

MS SVS max.

H18

Remarks:

Following pump adjustment, strew out residual—quantity adjusting screw 2 mm.

On initial measurement, screw in residual-quantity adjusting screw 2 mm.

Note inst. in remarks column

Test scheet : RFN

Edition : 12.02.93

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/9F2200L153-2

Type number : 0 460 494 303

Customer Part-No. :

Customer-specific information

Customer

: RNUR

Engine

: J8S

TEST BENCH REQUIREMENTS

Calibrating-oil

return temp.

with thermometer : 40.00...48,00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 022

Opening

bar: 130.00...133.00 Pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00

x Length

mm: 450

Start of delivery

Prestroke mm: -

(from BDC): -

Injection pump setting values

Test specifications in parentheses

Timing-device travel

1/min: 1400 Speed

Charge press. hPa: 800

Setting value mm: 4.00...4.40

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 1400 Speed hPa: 800 Charge press

Setting value bar: 5.10...5.70

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 1400

Charge press. hPa: 800

Del. quantity cm3/

1000s.: 47.00...48.00

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 2.5

1000s.: (3.0)

Full-load del. w/out charge press.:

1/min: 600 Speed

Del. quantity cm3/

1000s : 37.00 . . . 38.00

Shutoff

electromagnet Volt: 12

Low-idle speed regulation

Speed 1/min: 425

Del. quantity cm3/

1000s.: 7.00...11.00

Shutoff

electromagnet Volt: 12

Full-load speed regulation

1/min: 2400 Speed

Charge press hPa: 800

Del. quantity cm3/

1000s.: 23.00...29.00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100 Speed

Del. quantity cm3/: 60.00...80.00

1000s.: 60.00 mind

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

1st speed 1/min: 1060

Charge press hPa: 800

TD travel mm: 1.90...2.70

mm: (1.60...3.00)

electromagnet Volt: 12.0

2nd speed 1/min:		+	Shutoff	
Charge press hPa:		+	electromagnet Volt	
	4.004.40	+	Del. quantity cm3/	
	(3.504.90)	+		: (38.5044.50)
Shutoff		+		: 2700
electromagnet Volt:	12	+	Charge press. hPa	: 800
3rd speed 1/min:		+	Shutoff	
Charge press hPa:		+	electromagnet Volt	: 12
	5.706.50	+	Del. quantity cm3/	
	(5.406.80)	+	1000\$	
Shutoff	45	†		: 2500
electromagnet Volt:		†	Charge press. hPa	: 800
4th speed 1/min:		†	Shutoff	43.0
Charge press hPa:		+	electromagnet Volt	
	6.27.0	†	Del. quantity cm3/	: 2.5017.50
mm:	ui-	†	1000\$.	
Supply-pump pressure	a chanactanistic.	†	5th speed 1/min	
antibity about the easter	e Character ISLIC.	Ť	Charge press. hPa	: 800
1st speed 1/min:	400	Ť	Shutoff	. 12 A
Charge press. hPa:		T	electromagnet Volt	
Supply—pump		Ι	Del. quantity cm3/	: (22.0030.00)
	2.603.20	Ι		: 2000
Shutoff	2.005.20	Ι	Charge press. hPa	
electromagnet Volt:	12	1	Shutoff	. 000
2nd speed 1/min:		L	electromagnet Volt	. 12 0
Charge press. hPa:		1	Del. quantity cm3/	43 40 45 40
Supply-pump		1	10005	(42.1046.70)
	5.105.70	1	7th speed 1/min	
Shutoff		1	Charge press. hPa	
electromagnet volt:	12	1	Shutoff	. 000
3rd speed 1/min:		+	electromagnet Volt	12.0
Charge press. hPa:		1	Del. quantity cm3/	
Supply-pump		1		(45.2049.80)
	6.907.50	+	8th speed 1/min	
Shutoff		+	Charge press. hPa	
electromagnet Volt:	12	+	Shutoff	
		+	electromagnet Volt	
Overlow quantity at	overflow valve:	+	Del. quantity cm3/:	: 44.9047.90
		+	1 000 s	: (43.4049.40)
1st speed 1/min:		+	9th speed 1/min	
Charge press. hPa:	~~	+	Charge press. hPa	; -
Shutoff	10.0	+	Shutoff	4.6
electromagnet Volt:		+	electromagnet Volt	
	41.7083.40	+	Del. quantity cm3/:	
quantity cm3/10s: 2nd speed 1/min:	2000	+	1000\$.:	(34.5040.50)
		+	88h	
Charge press. hPa: Shutoff	800	†	Mech. shutoff:	
electromagnet Volt:	10	T		
	55.60139.00	T	Electr. shutoff:	
quantity cm3/10s:		I	1st speed 1/min:	
Addition by CIID/ 105.	(I	Del. quantity cm3/:	
Delivery-quant. and	breakaway chan ·	I	1000 -	(0.003.00)
Justinery quality and	or cardway that	1	Shutoff	(0.00,,.00)
		1	electromagnet volt:	
1nd speed 1/min:	600	1	Cacci Gilagi ica VOCE,	
Charge air pressure-		1	Idle delivery:	
point hPa:		1	and macrifely.	
	4.5	1	1st speed 1/min:	: 425
		1	-,	the state of the s

H20

Shutoff electromagnet Volt: 12 Del. quantity cm3/: 7.00...11.50 1000s.: (5.00...13.00) cm3/: 2.5 1000s.: (3.0) 1/min: 520 Dispersion 2nd speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 3.00...7.00 1000s.: (1.00...9.00) 3rd speed 1/min: 660 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Automatic starting fuel delivery: 1/min: 300 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 20.00...40.00 1000s.: -2nd speed 1/min: 180 Shutoff electromagnet Volt: 12.0 Del. quantity cm3/: 40.00...100.00 1000s.: -Shutoff electromagnet: Cut-in min voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation mm: 3.2...3.4 K KF mm: 5.6...6.0 MS mm: 1.3...1.7 SVS max. mm: 3.0 LDA stroke mm: 4.5 Remarks: Operate control lever after each manifold-pressure compensator pressure change. * Correction at adjusting nut

BOSCH-INJ. -PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test scheet

Edition : 15.02.93 replaces : 13.04.92 Calibrating oil : ISO-4113

Injection pump : VE4/9F2100R471 Type number : 0 460 494 308

Customer Part-No. :

Customer-specific information

Customer

Engine : 1,9 L UD T4

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil °C return temp,

with thermometer : 40.00...48.00 : 42.00...50.00 Electronically

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 000

Openina |

Pressure bar: 147.00...150.00

Test inj. tubing : 1 680 750 017

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 840

Start of delivery Prestroke mm: -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1250

Setting value mm: 3.70...4.10

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 1250 Spec

Setting value bar: 5.30...5.90

Shutoff

electromagnet Volt: 12

Full-load del. w/out charge press.:

1/min: 1250 Speed

Del. quantity cm3/ 1000s.: 43.00...44.00

Shutoff

electromagnet Volt: 12.0 Dispersion cm3/: 2.5 1000s.: (3.0)

Low-idle speed regulation

1/min: 425 Speed

Del. quantity cm3/

1000S.: 7.00...9.00

Shutoff

electromagnet Volt: 12.0 Del. quantity cm3/: 2.0 1000s.: (3.0)

Residual-Delivery Setting

Speed 1/min: 550

Del. quantity cm3/

1000s.: 5.50...6.50

Shutoff

electromagnet Volt: 12

Full-load speed regulation

Speed 1/min: 2400

Del. quantity cm3/

1000s.: 12.00...16.00

Shutoff

electromagnet Volt: 12

Start:

1/min: 100 Speed

Del. quantity cm3/: 40.00...90.00

mind 1000s.: 40.00

Shutoff

electromagnet Volt: 12

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

Speed 1/min: 1250

Inj.-qty. cm3/

difference 1000S.: 6.00...8.00 #

Shutoff

electromagnet Volt: 12 SP press.—dif.measurement pompa di mandata (FP) 1.Speed 1/min: 1250

Supply pump 1nd speed 1/min: 2650 pressure Shutoff electromagnet Volt: 12.0
Del. quantity cm3/: 0.00...3.00
1000s.: Znd speed 1/min: 2400 difference bar: 0.10...0.30 # Shutoff electromagnet Volt: 12 Inspection-pump test specifications Shutoff electromagnet Volt: 12 Del. quantity cm3/: 12.00...16.00 1000s.: (10.00...18.00) Test specifications in parentheses Timing-device characteristic: 3rd speed 1/min: 2250 1st speed 1/min: 750 Shutoff TD travel mm: 1.10...1.90 alectromagnet Volt: 12.0 Del. quantity cm3/: 25.00...35.00 1000s.: (24.00...36.00) 4th speed 1/min: 1850 mm: (0.70...2.30) electromagnet Volt: 12.0 2nd speed 1/min: 1250 TD travel mm: 3.70...4.10 mm: (3.10...4.70) Shutoff electromagnet Volt: 12.0 Shutoff Del. quantity cm3/: 41.1...43.10 1000s.: (39.90...44.30) electromagnet Volt: 12 3rd speed 1/min: 1700 1/min: 1250 5th speed mm: 5.60...6.40 TD travel Shutoff mm: (5.20...6.80) electromagnet Volt: 12 Del. quantity cm3/: 43.00...44.00 1000s.: (41.30...45.70) 6th speed 1/min: 750 Shutoff electromagnet Volt: 12 6th speed Supply-pump pressure characteristic: Shutoff electromagnet Volt: 12.0 Del. quantity cm3/: 34.30...37.30 1000s.: (32.80...38.80) 1/min: 750 1st speed Supply-pump bar: 3.80...4.40 pressure 7th speed 1/min: 450 Shutoff Shutoff electromagnet Volt: 12.0 Del. quantity cm3/: 32.30...38.30 1000s.: (29.80...40.80) electromagnet volt: 12 2nd speed 1/min: 1250 Supply-pump pressure bar: 5.30...5.90 Shutoff Mech. shutoff: electromagnet Volt: 12 3rd speed 1/min: 1700 Electr. shutoff: Supply pump pressure bar: 6.60...7.20 1/min: 425 1st speed Shutoff Del. quantity cm3/: 0.00...3.00 electromagnet Volt: 12 1000s.: (0.00...3.00) Shutoff Overlow quantity at overflow valve: electromagnet volt: -1st speed 1/min: 750 Damper set qty.: Shutoff electromagnet Volt: 12 LFG-setting: : 41.70...83.40 solidale con carcassa: Idle delivery: Overflow cm3/10s: (27.80...97.30) quantity 2nd speed 1/min: 1850 Shutoff 1st speed 1/min: 425 electromagnet Volt: 12 Shutoff Overflow : 55.60...138.90 electromagnet Volt: 12 Del. quantity cm3/: 7.00...9.00 1000\$:: (4.00...12.00) quantity cm3/10s: (41.70...153.90) Delivery-quant. and breakaway char.: High Idle:

1/mi: 500 1st speed Shutoff Shutoff electromagnet Volt: 12.0 electromagnet Volt: 12 Del. quantity cm3/: 7.00...9.00 Part-load del.at 3rd inj.-uty. 1000s.: (4.00...12.00) terza fermo della portata stop (EGR set) Residual: scarico) (ARF) gaz d'échappement-ARF) 1/min: 550 1.Rotacao Spacing mm: 12.0 Shutoff electromagnet Volt: 12 1/min: 1000 1st speed Del. quantity cm3/: 5.50...6.50 Shutoff 1000s.: (4.00...8.00) electromagnet Volt: 12 Del. quantity cm3/: 27.00...29.00 1/min: 515 2nd speed Shutoff 1000s.: (25.00...31.00) electromagnet Volt: 12 Del. quantity cm3/: 5.50...7.50 1000s.: (4.00...9.00) Automatic starting fuel delivery: 1st speed 1/min: 180 Load-dependent start of delivery: Shutoff Inj.-qty.dif.measurement: electromagnet Volt: 12 Del. quantity cm3/: 40.00...90.00 1st speed 1/min: 1250 1000s.: (40.00...90.00) Inj.-aty. cm3/ : - 7.0..13.0 " difference 1000s.: -2nd speed 1/min: 380 Shutoff Shutoff electromagnet Volt: 12.0 electromagnet Volt: 12 2nd speed 1/min: 1250 Del. quantity cm3/: 25.00...45.00 cm3/: MAX. 1000s.: (25.60...45.00) Inj. cty. difference 1000S.: 0.00...3.00 ' Shutoff 4th speed 1/min: 100 electromagnet Volt: 12.0 3rd speed 1/min: 1250 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.00...90.00 cm3/: ALFB: 0..0.6 Inj.-qty. difference 1000S.: -1000s.: (40.00...90.00) KSB/AFB valve Volt: 12.0 Shutoff electromagnet: Shutoff electromagnet Volt: 12.0 Cut-in min voltage : 10.0 TD-travel dif.measurement: Rated voltage : 12.0 correttore anticipo iniezione (SV): 1st speed 1/min: 1250 Mounting and assembly dimensions: : - 0.9...1.1 " TD-travel difference mm: (0.30...0.50)Designation mm: 3.2...3.4 mm: 5.1...5.5 mm: 1.2...1.4 Shutoff electromagnet Volt: 12 KF 2nd speed 1/min: 1250 MS : - 1.3...1.7 TD-travel difference Remarks: Shutoff electromagnet Volt: 12.0 SP press.—dif.measurement: Following pump adjustment, screw out pompa di mandata (FP): residual-quantity adjusting screw 2 mm. 1/min: 1250 1st speed Supply pump-On initial measurement, screw in : - 0.7...1.1 ' pressure residual-quantity adjusting screw 2 mm. difference bar: -

BOSCH-INJ.-PUMP TEST SPECIFICATIONS Note inst. in remarks column 4 Test scheet : F1A Edition : 12.02.93 replaces : 13.04.92 Calibrating oil : ISO-4113 Injection pump : VE4/9F205UR476 Type number : 0 460 494 317 Customer Part-No. : Customer-specific information Customer : IVECO-SOFIM Engine : 8144.97.2500 TEST BENCH REQUIREMENTS Overflow restricti: 1 463 456 303 Calibrating-oil return temp. with thermometer : 40.00...48.00 Electronically : 42.00...50.00 Inlet press., bar: 0.30...0.40 Calibrating nozzle-holder assembly : 1 688 901 022 Opening. Pressure bar: 130.00...133.00 Test inj. tubing : 1 680 750 073 Outside diameter : 6.00 x Wall thickness : 2.00 mm: 450 x Length Start of delivery Indicator setting Piston stroke mm: 1,0 **Outlet** : A Injection-pump setting values Test specifications in parentheses Timing-device travel 1/min: 1400

Supply-pump pressure 1/min: 1400 Speed Charge press hPa: 1000 Setting value bar: 6.10...6.70 Shutoff electromagnet Volt: 12 Full-load del. with charge press.: 1/min: 1200 Charge press. hPa: 1000 Del. quantity cm3/ 1000s.: 67.50...68.50 Shutoff electromagnet Volt: 12 Dispersion cm3/: 3.0 1000s.: (3.0) Full-load del. w/out charge press.: Speed 1/min: 500 Del. quantity cm3/ 1000s.: 41.50...42.50 Shutoff electromagnet Volt: 12 Low-idle speed regulation Speed 1/min: 425 Del. quantity cm3/ 1000s.: 10,5...14,5 Shutoff electromagnet Volt: 12.0 Del. quantity cm3/: 2,5 1000s.: -Residual-Delivery Setting 1/min: 550 Speed Del. quantity cm3/ 1000s.: 0.50...5.50 Shutoff electromagnet Volt: 12 Full-load speed regulation Speed 1/min: 2400 Charge press hPa: 1000 Del. quantity cm3/ 1000s.: 35.00...41.00 Shutoff electromagnet Volt: 12.0 Start: Speed 1/min: 100 Del. quantity cm3/: 50.00...74.00 1000s.: 50.00

Shutoff

Charge press. hPa: 1000

electromagnet Volt: 12

mm: 5.10...5.50

Setting value

Shutoff 1/min: 1400 2nd speed Charge press. hPa: 1000 electromagnet Volt: 12 Supply-pump Load-dependent start of delivery: bar: 6.10...6.70 pressure Inj.-qty.dif.measurement: Shuroff electromagnet Volt: 12 3rd speed 1/min: 2050 1/min: 1000 Speed Charge press hPa: 1000 Charge press. hPa: 1000 Inj.—aty. cm3/ difference 1000S.: - 19.0...21.0 # Supply-pump pressure bar: 8.40...9.00 Shutoff Shutoff electromagnet Volt: 12 SP press.-dif.measurement electromagnet Volt: 12 pompa di mandata (FP) Overlow quantity at overflow valve: 1.Speed 1/min: 1000 Charge press Supply pump hPa: 1000 1/min: 500 1st speed Charge press. hPa: -Shutoff pressure difference bar: 0.10...0.30# overflow : 41.70...83.40 quantity cm3/10s: (26.70...98.40) 2nd speed 1/min: 2050 Charge press here 1000 electromagnet Volt: 12 Shutoff electromagnet Volt: 12.0 Inspection-pump test specifications Test specifications in parentheses Shutoff electromagnet Volt: 12 Timing-device characteristic: : 55.60...139.00 Overflow cm3/10s: (40.60...154.00) quantity 1/min: 1800 2nd speed Charge press hPa: 1000 Delivery-quant. and breakaway char.: mm: 8.10...8.90 mm: (7.80...9.20) TD travel Shutoff 1nd speed 1/min: 600 electromagnet Volt: 12
3rd speed 1/min: 1400
Charge press hPa: 1000
TD travel mm: 5.10...5.50 Charge-air pressure-setting hPa: 350* LDA-stroke mm: 4,5 Shutoff mm: (4.80...5.80) electromagnet Volt: 12 Del. quantity cm3/: 47.50...48.50 1000s.: (45.50...50.50) Shutoff electromagnet Volt: 12 4th speed 1/min: 1000 1/min: 2750 2nd speed Charge press. hPa: 1000 Shutoff Charge press hPa: 1000 mm: 2.20...3.00 mm: (1.90...3.30) TD travel Shutoff electromagnet Volt: 12 5th speed 1/min: 2050 Charge press. hPa: 1000 TD travel mm: 9.60...10.40 Charge press. hPa: 1000 Shutoff mm: (9.30...10.70) Shutoff electromagnet Volt: 12 Charge press. hPa: 1000 Shutoff Supply-pump pressure characteristic: electromagnet Volt: 12 Del. quantity cm3/: 68.00...71.00 1000s.: (67.30...71.70) 1/min: 600 1st speed Charge press. hPa: 1000 Supply-pump pressure bar: 3.10...3.70 12th speed 1/min: 1200 Shutoff Charge press. hPa: 1000 electromagnet Volt: 12

Shutoff electromagnet Volt: 12 Del. quyntity cm3/: 67.5068.50	Charge press. hPa: 1000 Injqty. cm3/: MAX. difference 1000S.: 4.009.00 Shutoff electromagnet Volt: 12.0 TD-travel dif.measurement:
electromagnet Volt: 12 Del. quantity cm3/: 41.5042.50 10005: (39.5044.50)	correttore anticipo iniezione (SV): 1st speed 1/min: 1000 Charge press. hPa: 1000 TD-travel : -0.700.90"
Mech. shutoff:	difference mm: -
Electr. shutoff:	electromagnet Volt: 12 2nd speed 1/min: 1000
1st speed 1/min: 425 Del. quantity cm3/: 0.003.00 10005:: (0.003.00)	Charge press. hPa: 1000 TD-travel : -1,101.9
Shutoff electromagnet volt: -	Part-load del.at 3rd injqty. terza fermo della portata stop (EGR set)
Damper set qty.:	scarico) (ARF) gaz d'échappement-ARF)
LFG-setting: solidate con carcassa: Idle delivery:	Spacing mm: 12.0
1st speed 1/min: 425	+ 1st speed 1/min: 1000 + Charge press. hPa: - + Shutoff
Shutoff electromagnet Volt: 12 Del. quantity cm3/: 10.5014.50	electromagnet Volt: 12 Del. quantity cm3/: 22.0024.00 10008.: (20.5025.50)
1000s.: (9.5015.50)	Automatic starting fuel delivery:
High Idle:	1st speed 1/min: 200
1st speed 1/mi: 500 Shutoff	+ Shutoff + electromagnet Volt: 12
electromagnet Volt: 12 Del. quantity cm3/: 11.0015.00 1000S.: (10.0016.00)	Del. quantity cm3/: 50.0074.00 1000s.: (50.0074.00)
Residual:	2nd speed 1/min: 350 Shutoff
1.Rotacao 1/min: 550 Shutoff	+ electromagnet Volt: 12 + Del. quantity cm3/: 36.0048.00 + 1000S.: (36.0048.00)
electromagnet Volt: 12 Del. quantity cm3/: 0.505.50 1000S.: -	+ 4th speed 1/min: 100
Del. quantity cm3/: 0.002.00	<pre>Shutoff electromagnet Volt: 12 Del. quantity cm3/: 50.0074.00</pre>
Load-dependent start of delivery: Injqty.dif.measurement:	1000s.: (50.0074.00)
1st speed 1/min: 1000	Shutoff electromagnet:
Charge press. hPa: 1000 Injqty. cm3/ : -18.026.0" difference 10005.: - Shutoff	Cut-in min voltage : 10.0 Rated voltage : 12.0
electromagnet Volt: 12 2nd speed 1/min: 1000	Mounting and assembly dimensions:

Designation

mm: -mm: 5.6...6.0 mm: 1.1...1.5 KF MS

LDA stroke mm: 4.5

Ajustement Potentiometer:

Angle ter

pot. °: 25

Supply voltage

pot. volt: 5.0

Output volt

pot. volt: 2.1

Remarks:

Operate control lever after each manifold pressure compensator pressure change.

* Correction at adjusting nut

BOSCH-INJ. - PUMP TEST SPECIFICATIONS

Note inst. in remarks column

Test scheet : REN

Edition : 12.02.93

replaces

Calibrating oil : ISO-4113

Injection pump : VE4/9F2350R309-3 Type number : 0 460 494 324

Customer Part-No. :

Customer-specific information

Customer

Engine : J8S R21 EURO 93

TEST BENCH REQUIREMENTS

Overflow restricti: 1 463 456 303

Calibrating-oil return tama.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

: 1 688 901 020 assembly

Opening |

bar: 130.00...133.00 Pressure

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 450

Start of delivery Prestroke mm: -(from BDC): -

Injection-pump setting values Test specifications in parentheses

Timing-device travel

1/min: 1125

Setting value mm: 2.60...3.00

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 1125 Speed

Setting value bar: 4.20...4.80

Shutoff

electromagnet Volt: 12

Full-load del. w/out charge press.:

1/min: 1125

Del. quantity cm3/

1000s.: 36.20...37.20

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 2,5 1000S.: (3.0)

Low-idle speed regulation

1/min: 400 Speed

Del. quantity cm3/

1000s.: 6.00...10.00

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 2,5 1000S.: (3.0)

Residual-Delivery Setting

1/min: 500 Speed

Del. quantity cm3/

1000s.: 2.00...6.00

Shutoff

electromagnet Volt: 12.0

Full-load speed regulation

Speed 1/min: 2500

Del. quantity cm3/

1000s.: 20.00...26.00

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 100 Del. quantity cm3/: 52.00...92.00

1000s.: 52.00 mind

Shutoff

electromagnet Volt: 12

Load-dependent start of delivery: Inj.-qty.dif.measurement:

Speed 1/min: 1125

Inj.-qty. cm3/

difference 1000s.: 10.00...12.00 #

Shutoff

electromagnet Volt: 12 SP press.-dif.measurement pompa di mandata (FP) 1.Speed 1/min: 1125

Supply pump 1/min: 1125 1nd speed pressure Shutoff difference bar: 0.10...0.30 # Shutoff electromagnet Volt: 12.0 Inspection-pump test specifications Shutoff electromagnet Volt: 12 Del. quantity cm3/: 33.70...36.70 1000s.: (32.9...37.50) Test specifications in parentheses Timing-device characteristic: 1/min: 1750 3rd speed 1st speed 1/min: 800 Shutoff mm: 0.70...1.50 electromagnet Volt: 12 Del. quantity cm3/: 34.90...36.90 1000S.: (33.60...38.20) TD travel mm: (0.40...1.80) electromagnet Volt: 12.0
2nd speed 1/min: 1125
TD travel mm: 2.60...3.00
mm: (2.10...3.50) 1/min: 2250 4th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 35.20...37.20 1000\$.: (33.90...38.50) Shutoff electromagnet Volt: 12 3rd speed 1/min: 2000 1/min: 2500 5th speed TD travel mm: 7.10...7.90 Shutoff mm: (6.80...8.20) electromagnet Volt: 12 Del. quantity cm3/: 20.00...26.0 1000s.: (19.00...27.00) 6th speed 1/min: 2650 Shutoff electromagnet Volt: 12 6th speed Supply-pump pressure characteristic: Shutoff 1/min: 800 1st speed Supply-pump pressure bar: 3.10...3.70 Shutoff Shutoff electromagnet Volt: 12 electromagnet Volt: 12.0 1/min: 1125 2nd speed Del. quantity cm3/: 0.00...5.00 Supply-pump 1000s.: pressure bar: 4,20...4.80 Shutoff Mech. shutoff: electromagnet Volt: 12 3rd speed 1/min: 2000 Electr. shutoff: Supply-pump pressure bar: 6.50...7.10 1st speed 1/min: 400 Shutoff Del. quantity cm3/: 0.00...3.00 electromagnet Volt: 12 1000s.: (0.00...3.00) Shutoff Overlow quantity at overflow valve: electromagnet volt: -1/min: 800 1st speed Damper set qty.: Shutoff electromagnet Volt: 12 LFG-setting: : 41.70...83.40 solidale con carcassa: Idle delivery: Overflow cm3/10s: (26.70...98.40) 1/min: 2250 quantity 2nd speed Shutoff 1st speed 1/min: 400 electromagnet Volt: 12 Shutoff : 55.60...139.00 Overflow electromagnet Volt: 12.0 quantity cm3/10s: (40.60...154.00) Del. quantity cm3/: 6.00...10.00 1000s.: (4.00...12.00) Delivery-quant. and breakaway char.: High Idle:

1st speed 1/mi: 500 Shutoff electromagnet Volt: 12.0 Del. quantity cm3/: 8.50...12.50 1000s.: (6.50...14.50) Residual: 1.Rotacao 1/min: 500 Shutoff electromagnet Volt: 12.0 Del. quantity cm3/: 2.00...6.00 1000s.: -Load-dependent start of delivery: Inj.-qty.dif.measurement: 1/min: 1125 1st speed Inj.-qty. cm3/ : 11,0...15.0 " difference 1000S.: -Shutoff electromagnet Volt: 12 1/min: 1125 2nd speed cm3/: MAX. Inj.-qty. difference 1000s.: 2.00...8.00 ' Shutoff electromagnet Volt: 12.0 TD-travel dif.measurement: correttore anticipo iniezione (SV): 1st speed 1/min: 1125 TD-travel : 0.50...0.70 " difference mm: -Shutoff electromagnet Volt: 12 2nd speed 1/min: 1125 : 1.10...1.50 ' TD-travel difference mm: -Shutoff electromagnet Volt: 12.0 Automatic starting fuel delivery: 1st speed 1/min: 310 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 25.00...45.00 1000s.: -2nd speed 1/min: 210 Shutoff electromagnet Volt: 12.0 Del. quantity cm3/: 45.00...85.00 1000s.: -Shutoff electromagnet: Cut-in min voltage : 10.0 Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: 3.2...3.4 kF mm: 5.3...5.7 mm: 1.3...1.7 SVS max. mm: 3.0

Remarks:

On initial measurement, screw in residual-quantity adjusting screw 1 mm.

Screw out residual—quantity adjusting screw 1 mm after setting pump.

J03

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB 2,5 c7 Edition : 08.10.91 Replaces Test oil : ISO-4113 Combination no. : 0 400 075 936 Injection pump Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986 Governor Governor design: : RSF340/2300M64-14 : 0 420 021 142 Governer no. Cust. part no. : T3 Customer-spec. information Customer : MB-PKW Engine : OM602A-Abgast. : 92.0 1st version kw TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder : 0 681 343 009 assembly Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600 (A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

: 2.20...2.30

: (2.15...2.35)

per values

BEGINNING OF DELIVERY

Prestroke mm

Test pressure, bar: 30...32

Firing order : 1-2-4-5-3 Phasing : 0-72-144-216-288 Tolerance + - ° : 0.00 (1.00) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1000 Rack travel in mm : 13.90...14.00 Del.quantity cm3/ : 5.1...5.2 100 s: (5.0...5.3) Spread cm3 : 0.2 100 s: (0.3) rpm : <u>3</u>15.0 2nd speed Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 0.55...0.65 100 s: (0.45...0.9) Spread cm3 : 0.1 100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1850 : 51.0...52.0 Del.quantity 1000 : (50.0...53.0) : 2.50 Spread cm3 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8.1...8.5 rpm : 2500 Speed 4th rack travel in: 2950 : 0.00...1.00 Speed rom SET IDLE CONTROL LEVER POSITION : 1000 Speed rpm Rack travel in mm : 1,7...1,8 LOW IDLE 1 Control Lever

Rack travel in mm : 20.00...22.00

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.4 Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50 Speed rpm : 540640	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 1000 Maximum rack trave: 1.80	T STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100 - Del.quantity cm3/ : 52.00.0 - 1000 s: (52.00.0) - Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude	HIGH IDLE 1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm : 315 Rack travel in mm : 5.305.50 Del.quantity cm3/ : 5.56.5 1000 s: (4.59.0) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	+ SETTING/TESTING ELECTRONIC IDLE + REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS 1st version	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,614,0) Del.quantity cm3/: - 1000 s: (41,049,0) Current A : 1,8
Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/: - min. 1000 s: 52,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

TESTING PNEUMATIC SHUTOFF DEVICE -Control lever at idle stop. With n = 315 1/min. and pu = 450 mbar, control rod must move quickly to control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY—Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2.472...2.532
(2.442...2.562) V must be displayed
on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF -Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MB 2,5 c7 : 27.10.92 Test sheet Edition Replaces : 08.10.91 Test oil : ISO-4113

Combination no. : 0 400 075 936

Injection pump

Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986

Governor

Governor design: : RSF340/2300M64-14 : 0 420 021 142 Governer no.

Cust. part no. : T4

Customer-spec. information Customer : MB-PKW

: OM602A-Abgast. Engine

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Openina

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2 Spread

100 s: (0.3)

2nd speed rpm : 315.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 0.55...0.65 100 s: (0.45...0.9)

cm3 : 0.1 Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000Aneroid pressure h: 1850

: 51.0...52.0 Del.quantity

1000 : (50.0...53.0) cm3 : 2.50 1000 : (3.00) Spread

RATED SPEED

1st version Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

Speed rpm : 2500 4th rack travel in: 2950

: 0.00...1.00 Speed rpm

SET IDLE CONTROL LEVER **POSITION**

rpm Rack travel in mm : 1,7...1,8

LOW IDLE 1 Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.4 Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50	Del.quantity cm3/: 48.550.5 1000 s: (47.551.5) Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 1000 Del.quantity cm3/: 33.034.0 1000 s: (32.035.0) Spread cm3 : 2.50 1000 s: (3.00)
Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,24,4 : (4,14,5)	Speed rpm : 100 Del.quantity cm3/: 52.00.0 1000 s: (52.00.0) Rack travel in mm : 20.100.00
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude	HIGH IDLE 1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/: 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Speed rpm: 315 Rack travel in mm: 5.305.50 Del.quantity cm3/: 5.56.5 1000 s: (4.59.0) Spread cm3: 1.00 1000 s: (1.50)
Measurement Speed 1/min : 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050 Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10 FUEL DELIVERY CHARACTERISTICS 1st version	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,614,0) Del.quantity cm3/:- 1000 s: (41,049,0) Current A : 1,8
Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/ : 50.051.5	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0.01.0 Current short-duration A : 3.0 Starting test Speed rpm : 100 Del.quantity cm3/:- min. 1000 s: 52,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 mm

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.
Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2.472...2.532
(2.442...2.562) V must be displayed
on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF —Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : 27.10.92 Replaces Test oil : ISO-4113 Combination no. : 0 400 075 936 Injection pump Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986 Governor Governor design. : RSF340/2300M64-14 : 0 420 021 142 Governer no. Cust, part no. : T8 Customer-spec. information Customer : MB-PKW Engine : OM602A-Abgast. 1st version kW : 92.0 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder : 0 688 901 111 assembly Opening pressure, bar : 144...150 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32 : 2.20...2.30 Prestroke mm : (2.15...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3 Phasing : 0-72-144-216-288 Tolerance $+ - ^{\circ} : 0.00 (1.00)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 1000Rack travel in mm: 13.90...14.00 Del.quantity cm3/: 5.2...5.3 100 s: (5.1...5.4) Spread cm3 : 0.2100 s: (0.3) 2nd speed rpm : 315.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.65...0.75 100 s: (0.55...1.0) Spread cm3 : 0.1100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000Aneroid pressure h: 1850 Del.quantity : 52.5...54.5) : 2.50 Spread cm3 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8.1...8.5 Speed rpm : 2500 4th rack travel in: 2950 rpm : 0.00...1.00Speed SET IDLE CONTROL LEVER POSITION rpm : 1000Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 8...12 Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) Setting point w/out bumper spring rpm : 315 Speed Spread cm3 : 2.50Rack travel in mm: 5.4 1000 s: (3.00) Aneroid pressure h: 1050 Testing: Speed rpm : 1000 Speed rom : 220 Del.quantity cm3/: 34.0...35.0 Minimum rack trave: 8.00 1000 s: (33.0...36.0) rpm : 315 cm3 : 2.50Spread Rack travel in mm : 5.30...5.50 1000 s: (3.00) Rack travel in mm : 2.50 : 540...640 Speed rpm : 1000 Speed rpm STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING Speed rpm : 100 rpm : 380 Del.quantity cm3/ : 53.0...0.0 Speed Rack travel in mm: 4,2...4,4 1000 s: (53.0...0.0) : (4,1...4,5)Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version 1st speed rpm : 1000 1st version Rack travel in m: 13.90...14.00 Aneroid pressure h: 1850 rpm : 1600 2nd speed rpm : 2500 Rack travel in m: 13.10...13.30 Rack travel in mm : 8.10...8.50 3rd speed rpm : 2200 Del.quantity cm3/: 29.0...33.0 Rack travel in m: 12.30...12.50 1000 s: (28.0...34.0) Spread cm3 : 2.50Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version Speed rpm : 315 Rack travel in mm : 5.30...5.50 Setting : 1000 Speed rpm Del.quantity cm3/: 6.5...7.5 Pressure hPa : 1600 1000 s: (5.5...10.0) Rack travel mm : 0.50...0.90 Spread cm3 : 1.001000 s: (1.50) Measurement 1/min: 1000 Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.90...4.20 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 5.70...6.10 rpm : 340 Rack travel in mm : (12,6...14,0) FUEL DELIVERY CHARACTERISTICS Del.quantity cm3/:-1000 s: (42,0...50,0) Current A : 1.8 1st version Aneroid pressure h: 1850 Control lever at full-load stop Speed : 1600 rpm : 2950 rpm Speed Del.quantity cm3/: 51.0...52.5 Rack travel in mm: 0.0...1.0 1000 s: (50.0...53.5) Current cm3 : 2.50 Spread short-duration A: 3.0 1000 s: (3.0) Starting test Aneroid pressure h: 1850 Speed rpm : 100 : 2200 Del.quantity cm3/: -Speed rpm min. 1000 s: 53,0 1,8A

Remarks:

Sliding sleeve pre-travel = 6.5 nm

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system:
adjustment and blocking with device
KDEF 1077 = 19.3°...19.7°
(19.2...19.8°) angular displacement of
cam following start of delivery of
cylinder no. 1.
Difference in start of delivery between
max. end min. value = max. 1° angular
displacement of cam

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

RWG adjustment
At engine speed of 1000 1/min
set delivery rate of 25.0...26.0
(24.0...27.0) ccm/1000 strokes
with control lever. Shift RWG until
U = 1.633...1.639 (1.635...1.637)v
is indicated. Tighten fastening
screws to 1...2 Nm. Move control
lever to full-load stop; voltage
value of 2.472...2.532 v must be
attained.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. -Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks : MB 2,5 C2 : 14.10.91 Test sheet Edition Replaces : ISO-4113 Test oil Combination no. : 0 400 075 937 Injection pump Pump designation : PESSM55C32ORS158 EP type number : 0 410 055 986 Governor Governor design: : RSF340/2300M74 : 0 420 021 140 Governer no. Cust. part no. : T3 Customer-spec. information Customer : MB-PKW : OM602A-Abgast. Engine 1st version kW : 92.0 TEST BENCH REQUIREMENTS Test oil inlet tematic : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder assembly : 0 681 343 009 Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3 Phasing : 0-72-144-216-288 Tolerance $+ - ^{\circ} : 0.00 (1.00)$ Time to cyl. no. : 1 BASIC SETTING rpm : 10001st speed Rack travel in mm : 13.90...14.00 Del.quantity cm3/ : 5.1...5.2 100 s: (5.0...5.3) Spread cm3 : 0.2100 s: (0.3) 2nd speed rpm : 345.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 0.5...0.6 100 s: (0.4...0.85) Spread cm3 : 0.1100 s: (0.15) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1850 Del.quantity : 51.0...53.0) : 2.50 Spread cm3 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 8.1...8.5 Speed rpm : 2500 4th rack travel in: 2950 rpm : 0.00...1.00Speed SET IDLE CONTROL LEVER POSITION rpm : 1000

Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12 Del.quantity cm3/ : 48.5...50.5 1000 s: (47.5...51.5) Setting point w/out bumper spring : 345 rpm : 2.50 Spread cm3 Rack travel in mm: 5.4 1000 s: (3.00) Aneroid pressure h: 1050 Testina: : 1000 Speed rpm Del.quantity cm3/: 33.0...34.0 1000 s: (32.0...35.0) Spread cm3 : 2.50 rpm Speed : 150 Minimum rack trave: 11.00 Speed rpm : 345
Rack travel in mm : 5.30...5.50
Rack travel in mm : 2.50 1000 s: (3.00) : 540...640 Speed COM rpm Speed : 1000 STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING Speed rpm : 100 Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) Speed rpm : 380 Rack travel in mm: 4.2...4.4 : (4.1...4.5) Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version 1st speed rpm : 1000 1st version Rack travel in m: 13.90...14.00 Aneroid pressure h: 1850 2nd speed : 1600 rom rpm : 2500 Rack travel in m: 13.10...13.30 Rack travel in mm : 8.10...8.50 Del.quantity cm3/: 29.0..33.0 1000 s: (28.0..34.0) rpm : 2200 3rd speed Rack travel in m: 12.30...12.50 Spread cm3 : 2.50 Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version Speed rpm : 345Rack travel in mm : 5.30...5.50 Del.quantity cm3/ : 5.0...6.0 Setting Speed nom 1000 Pressure hPa : 1600 1000 s: (4.0...8.5) : 0.50...0.90 Rack travel mm Spread cm3 : 1.00 1000 s: (1.50) Measurement 1/min : 1000 Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.90...4.20 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 5.70...6.10 Speed rpm ; 370 Rack travel in mm : (10.0...11.4) FUEL DELIVERY CHARACTERISTICS Del.quantity cm3/: -1000 s: (31,5...39,5) Current A 1st version Aneroid pressure h: 1850 Control lever at full-load stop rpm : 2950 Speed rpm : 1600 Speed Del.quantity cm3/: 50.0...51.5 1000 s: (49.0...52.5) Rack travel in mm: 0.0...1.0 Current cm3 : 2.50 Spread short-duration A: 3,0 1000 s: (3.5) Starting test Aneroid pressure h: 1850 Speed : 100 r'Dm Speed Del.quantity cm3/: -min. 1000 s: 52.0 COM : 2200 1.8A

Remarks:

* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 345 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control—lever position 35,5°, max.

0.2 mm control—rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control—lever position 33.0°, control—rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At n = 1000 min. -1,

I = 2.5 A, difference in delivery referenced to full-load delivery (4.4...6.4) ccm/1000 strokes.

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Spring-retainer setting: at 1000 min-1 = 1.7...1.8 mm

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY
-Set max. change plus/minus 0.75 mm
control-rod travel at correction
screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rcd-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

: MB 2,5 C2 : 28.10.92 Test sheet Edition Replaces : 14.10.91 Test oit : ISO-4113

Combination no. : 0 400 075 937

Injection pump

Pump designation : PES5M55C32ORS158 EP type number : 0 410 055 986

Governor

Governor design. : RSF340/2300M74 : 0 420 021 140 Governer no.

Cust. part no. : T4

Customer-spec. information : MB-PKW Customer

Engine : OM602A-Abgast.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 681 343 009 assembly

Opening

: 172...175 pressure, bar

Test lines : 1 680 750 014

Outside diameter x Wall thickness

: 6.00x2.00x600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 30,...32

Prestroke mm : 2.20...2.30

: (2.15...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

rpm: 1000 1st speed

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 345.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.85)

cm3 : 0.1Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000Aneroid pressure h: 1850

Del.quantity : 51.0...52.0 1000 : (50.0...53.0)

Spread cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version Control lever

position degrees: 50...0 3rd rack travel in: 8.1...8.5

Speed rpm : 2500 4th rack travel in: 2950

rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER

POSITION

: 1000 rom Rack travel in mm: 1.7...1.8

LOW IDLE 1 Control lever

Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) position degrees: 8...12 Setting point w/out bumper spring Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm : 345 Rack travel in mm : 5.4 Speed rpm : 1000 Del.quantity cm3/ : 33.0...34.0 Testing: Speed rpm : 150 Minimum rack trave: 10.0+1 1000 s: (32.0...35.0) Speed rpm : 345 Rack travel in mm : 5.30...5.50 Spread cm3 : 2.50 1000 s: (3.00) Rack travel in mm: 2.50 : 540...640 Speed rpm Speed : 1000 rpm STARTING FUEL DELIVERY Maximum rack trave: 1.80 Speed rpm : 100 Del.quantity cm3/ : 52.0...0.0 1000 s: (52.0...0.0) SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm: 4.2...4.4 : (4.1...4.5) Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version 1st speed rpm : 1000 1st version Rack travel in m: 13.90...14.00 Aneroid pressure h: 1850 rpm : 1600 2nd speed rpm : 2500 Rack travel in m: 13.10...13.30 Rack travel in mm : 8.10...8.50 Del.quantity cm3/: 29.0...33.0 1000 s: (28.0...34.0) Spread cm3: 2.50 3rd speed rpm : 2200 Rack travel in m: 12.30...12.50 Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version Speed rpm : 345 Rack travel in mm : 5.30...5.50 Setting Speed : 1000 man Del.quantity cm3/ : 5.0...6.0 Pressure hPa : 1600 1000 s: (4.0...8.5) : 0.50...0.90 cm3 : 1.00 Rack travel mm Spread 1000 s: (1.50) Measurement 1/min: 1000 Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.90...4.20 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 5.70...6.10 rpm : 370 Rack travel in mm : (10.0...11.4) FUEL DELIVERY CHARACTERISTICS Del.quantity cm3/: -1000 s: (31,5...39,5) Current A : 1.8 1st version Aneroid pressure h: 1850 Control lever at full-load stop : 1600 rpm : 2950 rpm Speed Del.quantity cm3/ : 50.0...51.5 Rack travel in mm: 0.0...1.0 1000 s: (49.0...52.5) Current cm3 : 2.50Spread short-duration A: 3.0 1000 s: (3.5) Starting test Aneroid pressure h: 1850 rpm : 100 Speed Speed rpm : 2200 Del.quantity cm3/: min. 1000 s: 52.0 1.8A

Remarks:

* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE PNEUMATIC SHUTOFF BOX—Control lever up against idle stop. At n = 345 1/min and pu = 450 mbar control rod must move briskly to control—rod travel = 0 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 35,5°, max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. -Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At n = 1000 min. -1,

I = 2.5 A, difference in delivery referenced to full-load delivery (4.4...6.4) ccm/1000 strokes.

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY—Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : 28.10.92 Edition Replaces Test oil : ISO-4113 Combination no. : 0 400 075 937 Injection pump Pump designation : PES5M55c320RS158 EP type number : 0 410 055 986 Governor Governor design. : RSF340/2300M74 : 0 420 021 140 Governer no. Cust, part no. : T8

Customer-spec. information Customer : MB-PKW Engine : OM602A-Abgast.

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 688 901 111

Opening

pressure, bar : 147...150

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY Test pressure, bar: 30...32

Prestroke mm : 2.20...2.30

: (2.15...2.35)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

Phasing : 0-72-144-216-288

Tolerance $+ - ^{\circ} : 0.00 (1.00)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.90...14.00

Del.quantity cm3/: 5.2...5.3

100 s: (5.1...5.4)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 345.0 Rack travel in mm : 5.3...5.5 Del.quantity cm3/ : 0.6...0.7 100 s: (0.5...0.9)

cm3 : 0.1Spread 100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure n: 1850

: 52.5...53.5 1**000** : (51.5...54.5) Del.quantity

cm3 : 2.50 1000 : (3.00) Spread

RATED SPEED

1st version Control lever

position degrees: 50...0 3rd rack travel in: 8,1...8,5

rpm : 2500 Speed 4th rack travel in: 2950

: 0.00...1.00 Speed riom

SET IDLE CONTROL LEVER POSITION

rpm : 1000Rack travel in mm : 1,7...1,8

LOW IDLE 1 Control lever

position degrees: 812 FD<270 Setting point w/out bumper spring Speed rpm : 345 Rack travel in mm : 5.4	Rack travel in m: 3.904.20 2nd pressure hPa : 750 Rack travel in m: 5.706.10
Testing: Speed rpm : 150 * Minimum rack trave: 10,0+1 Speed rpm : 345 Rack travel in mm : 5.305.50 Rack travel in mm : 2.50 Speed rpm : 540640 Speed rpm : 1000 Maximum rack trave: 1.80	FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 51.052.5 1000 s: (50.053.5) Spread cm3 : 2.50 1000 s: (3.0)
LOW IDLE 2 Control Lever position degrees: 8-12FD 270 Setting point w/out bumper spring Speed rpm : 345 Rack travel in mm : 5.35.5	Aneroid pressure h: 1850 Speed rpm : 2200 Del.quantity cm3/: 48.550.5 1000 s: (47.551.5 Spread cm3 : 2.50 1000 s: (3.00) Aneroid pressure h: 1050
Testing: Speed rpm : 220 Rack travel in mm : 8,0** Speed rpm : 345 Rack travel in mm : 5,35,5	Speed rpm: 1000 Del.quantity cm3/: 34.035.0 1000 s: (33.036.0) Spread cm3: 2.50 1000 s: (3.00)
Speed rom : 540 Rack travel in mm : 2,5 Speed rom : 640 Rack travel in mm : 2,5	STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4.24,4 : (4,14,5)	Speed rpm : 100 Del.quantity cm3/ : 53.00.0 1000 s: (53.00.0) Rack travel in mm : 20.100.00 HIGH IDLE
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.9014.00 2nd speed rpm : 1600 Rack travel in m: 13.1013.30 3rd speed rpm : 2200 Rack travel in m: 12.3012.50 Aneroid/Altitude	1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.108.50 Del.quantity cm3/ : 29.033.0 1000 s: (28.034.0) Spread cm3 : 2.50 1000 s: (3.00)
Compensator Test	LOW IDLE Speed rpm : 345
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.500.90	Rack travel in mm : 5.305.50 Del.quantity cm3/ : 6.07.0 1000 s: (5.09.5) Spread cm3 : 1.00 1000 s: (1.50)
Measurement Speed 1/min: 1000	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
1st pressure hPa : 1050	Į.

Control lever at idle stop Speed rpm : 370

Rack travel in mm : (10,0...11,4)

Del.quantity cm3/: -

1000 s: (32,5...40,5)

Current A : 1,8

Control lever at full-load stop

Speed rpm : 2950

Rack travel in mm : 0,0...1,0

Current

short-duration A: 3,0

Starting test

Speed rpm : 100 Del.quantity cm3/ : -

min. 1000 s: 53,0 1,8A

Remarks:

ad

Sliding sleeve pre-travel = 6.25 mm

* Sliding sleeve pre-travel = 4.7 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 44,5° max.
0.2 mm control-rod travel deduction

allowable after switchover point (of

starting cam) up to 1000 1/min.
-Control-lever position 42,0°,
control-rod travel deduction must be
greater than 0.2 mm after switchover
point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX
-Control lever up against idle stop.
At n = 345 1/min and pu = 450 mbar
control rod must move briskly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 19.3°...19.7° (19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1. Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

CORRECTION OF INJECTED—FUEL QUANTITY—Set max. change plus/minus 0.75 mm control—rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-

travel sensor with evaluation circuit KDEP-P400

Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.472...2.532 (2.442...2.562) V must be displayed

on the digital voltmeter.

RWG adjustment

At engine speed of 1000 1/min set delivery rate of 25.0...26.0 (24.0...27.0) ccm/1000 strokes with control lever. Shift RWG until U = 1.633...1.639 (1.635...1.637)V is indicated. Tighten fastening screws to 1...2 Nm. Move control lever to full-load stop; voltage value of 2.472...2.532 V must be attained.

ADJUSTMENT OF ACTIVE BUCKING DAMPING (ARD)

Control lever on full-load stop. At n = 1000 min. -1

I = 2.5 A, difference in delivery referenced to

delivery (5.6...7.6) ccm/1000 strokes.

J21

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet

: MB 2.5 C10

Edition

: 13.11.89

Replaces

Test oil

: ISO-4113

Combination no. : 0 400 075 944

Injection pump

Pump designation : PES5M55C32ORS177

EP type number

: 0 410 055 974

Governor

Governor design: : RSF340/2300M64-12

Governer no.

: 0 420 021 127

Customer-spec, information Customer

: MB-PKW

Engine

: 0M602A-USA MU90

1st version kW

: 92.0

TEST BENCH REQUIREMENTS

Test oil

-1

inlet temp. °C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order

: 1-2-4-5-3

SET IDLE CONTROL LEVER POSITION

rom

Rack travel in mm : 1,7...1,8

LOW IDLE 1

position degrees: 8...12

Setting point w/out bumper spring

122

Phasing

: 0-72-144-216-288

Tolerance $+ - ^{\circ} : 0.00 (1.00)$

Time to cyl. no. : 1

BASIC SETTING

1st speed

Spread

rpm : 1000

Rack travel in mm : 14.00...14.10

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0Rack travel in mm: 6.0...6.2

Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.8) cm3 : 0.1 Spread

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

: 2.50 cm3

1000 : (3.00)

RATED SPEED

Spread

1st version

Speed

Control lever

position degrees: 50...0

3rd rack travel in: 8,7...9,1

rpm : 2500 Speed

4th rack travel in: 2950

rpm : 0.00...1.00

Control lever

Speed rpm : 315 cm3 : 2.50 1000 s: (3.00) Spread Rack travel in mm: 6.1 Aneroid pressure h: 1050 Testing: rpm : 1000 Speed Del.quantity cm3/: 33.0...34.0 Speed : 220 mari Minimum rack trave: 8.00 1000 s: (32.0...35.0) rpm : 315 cm3 : 2.50 Speed Spread Rack travel in mm : 6.00...6.20 1000 s: (3.00) Rack travel in mm: 2.50 Speed rpm rpm : 1000 Speed STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING Speed rpm : 100 rpm : 380 Speed Del.quantity cm3/ : 52.0 Rack travel in mm: 4,7...4,9 1000 s: -: (4,6...5,0) Rack travel in mm: 20.1 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version 1st speed rpm : 1000 1st version Rack travel in m: 14.00...14.10 Aneroid pressure h: 1850 2nd speed rpm : 1600 rpm : 2500 Speed Rack travel in m: 13.30...13.50 Rack travel in mm : 8.70...9.10 3rd speed rpm : 2200 Del.quantity cm3/: 29.0...33.0 Rack travel in m: 12.50...12.70 1000 s: (28.0...34.0) cm3 : 2.50 Spread Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version Speed rpm : 315 Settina Rack travel in mm : 6.00...6.20 Del.quantity cm3/ : 5.0...6.0 Speed : 1000 rpm Pressure hPa : 1600 1000 s: (4.0...8.5) Rack travel mm : 0.30...0.70 cm3 : 1.00 Spread 1000 s: (1.50) Measurement 1/min: 1000 Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.40...3.60 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 4.90...5.30 Speed rpm : 340 Rack travel in mm : (12,8...14,2) FUEL DELIVERY CHARACTERISTICS Del.quantity cm3/:-1000 s: (41,0...49,0) : 1,8 Current A 1st version Aneroid pressure h: 1850 Control lever at full-load stop Speed rpm : 1600 rpm : 2950 Speed Del.quantity cm3/: 49.5...51.0 Rack travel in mm : 0,0...1,01000 s: (48.5...52.0) Current cm3 : 2.50 Spread short-duration A: 3,0 1000 s: (3.0) Starting test Aneroid pressure h: 1850 Speed rpm : 100 rpm : 2200 Speed Del.quantity cm3/:-Del.quantity cm3/: 48.5...50.5 min. 1000 s: 52,0 / 1,8A 1000 s: (47.5...51.5) Remarks:

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 44,5° max.
0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 42,0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Testing and adjusting the control-rod-travel sensor with evaluation circuit R2.1.3

Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 3.230...3.310 (3.190...3.350) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 23.0...24.0 (22.0...25.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 2.095...2.105 (2.098...2.102) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-

load stop; voltage value of 3.230... 3.310 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet Edition

: MB 2,5 C10 : 14.10.91

Replaces

Test oil

: 1SO-4113

Combination no. : 0 400 075 944

Injection pump

EP type number

Pump designation : PES5M556320RS177 : 0 410 055 974

Governor

Governor design: : RSF340/2360M64-12

Governer no.

: 0 420 021 127

Cust. part no.

: 13

Customer-spec. information Customer : MB-PKW

Engine

: 0M602A-USA MU90

1st version kw

: 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-2-4-5-3

Phasing

: 0-72-144-216-288

Tolerance $+ - ^{\circ}$: 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1000

Rack travel in nm : 13.70...13.80

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

cm3 : 0.2

100 s: (0.3)

rpm : 315.02nd speed

Rack travel in mm: 5.6...5.8 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.85)

Spread

Spread

cm3 : 0.1

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1000

Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0)

Spread

cm3 : 2.50 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 8.5...8.9

Speed rpm : 2500

4th rack travel in: 2950

Speed

rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

rpm : 1000

Rack travel in mm: 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12 cm3 : 2.50Spread Setting point w/out bumper spring 1000 s: (3.0n) Speed COM : 315 Aneroid pressure h: 1050 Rack travel in mm: 5.7 : 1000 Speed rom Del.quantity cm3/: 33.0...34.0 1000 s: (32.0...35.0) Testina: cm3 : 2.50 Speed rpm : 220 Spread Minimum rack trave: 8.00 1000 s: (3.00) rpm : 315 Speed Rack travel in mm : 5.60...5.80 : 1000 Speed rom STARTING FUEL DELIVERY Maximum rack trave: 1.80 SET IDLE AUXILIARY SPRING rpm : 100 Speed Del.quantity cm3/: 52.0...0.0 rpm : 380 Rack travel in mm: 4.7...4.9 1000 s: (52.0...0.0) : (4.6...5.0) Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version rpm : 1000 1st speed 1st version Rack travel in m: 13.70...13.80 Aneroid pressure h: 1850 rpm : 1600 2nd speed rpm : 2500Rack travel in m: 13.00...13.20 Rack travel in mm : 8.50...8.90 rpm : 22**0**0 Del.quantity cm3/: 29.0...33.0 1000 s: (28.0...34.0) 3rd speed Rack travel in m: 12.20...12.40 cm3 : 2.50 1000 s: (3.00) Spread Aneroid/Altitude Compensator Test LOW IDLE 1st version Speed rpm : 315 Setting Rack travel in mm : 5.60...5.80 Speed : 1000 Del.quantity cm3/ : 5.0...6.0 rom Pressure hPa : 1600 1000 s: (4.0...8.5) : 0.30...0.70 cm3 : 1.00Rack travel mm Spread 1000 s: (1.50) Measurement 1/min: 1000 Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.40...3.60 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 4.90...5.30 Speed rpm : 340 Rack travel in mm : (12.6...14.0) Del.quantity cm3/: -1000 s: (41.0...49.0) FUEL DELIVERY CHARACTERISTICS : 1.8 Current A 1st version Aneroid pressure h: 1850 Control lever at full-load stop Speed rpm : 1600rpm : 2950 Del.quantity cm3/: 49.5...51.0 Rack travel in mm: 0.0...1.0 1000 s: (48.5,...52.0) Current cm3 : 2.50Spread short-duration A: 3.0 1000 s: (3.) Starting test Aneroid pressure h: 1850 Speed rpm : 2200 Speed Del.quantity cm3/: -min. 1000 s: 52.0 rpm Del.quantity cm3/: 48.5...50.5 1000 s: (47.5...51.5) 1,8A Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF
—Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18.5...19.5 17.50...20.5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...

2.547 V must be attained.

BOSCH INJ. PUMP TEST SPECIFICATIONS

Note remarks

Test sheet : MB 2,5 C10 Edition : 28.10.92 Replaces : 14.10.91

Test oil : ISO-4113

Combination no. : 0 400 075 944

Injection pump

Pump designation : PES5M55C32ORS177 EP type number : 0 410 055 974

Governor

Governor design. : RSF340/2300M64-12

Governer no. : 0 420 021 127

Cust. part no. : T4

Customer-spec, information Customer : MB-PKW

Engine : 0M602A-USA MJ90

1st version kw : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly : 0 681 343 009

Opening

pressure, bar : 172...175

Test Lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00 Firing order : 1-2-4-5-3

Phasing : 0-72-144-216-288

Tolerance + - ° : 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 5.1...5.2

100 s: (5.0...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0 Rack travel in mm: 5.6...5.8 Del.quantity cm3/: 0.5...0.6

100 s: (0.4...0.85)

cm3 : 0.1 Spread

100 s: (0.15)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000Aneroid pressure h: 1850

Del.quantity : 51.0...52.0

1000 : (50.0...53.0) cm3 : 2.50

Spread 1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8.5...8.9

Speed rpm : 2500 4th rack travel in: 2950

Speed rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

rpm : 1000 Rack travel in mm : 1.7...1.8

LOW IDLE 1

Control lever

position degrees: 8...12 Spread cm3 : 2.50Setting point w/out bumper spring 1000 s: (3.00) Aneroid pressure h: 1050 Speed rom : 315 Speed rpm : 1000 Del.quantity cm3/: 33.0...34.0 Rack travel in mm: 5.7 Testing: 1000 s: (32.0...35.0) Speed rpm : 220 Spread cm3 : 2.50 Minimum rack trave: 8.00 1000 s: (3.00) rpm : 315 Rack travel in mm : 5.60...5.80 rpm : 1000 Speed STARTING FUEL DELIVERY Maximum rack trave: 1.80 Speed rpm : 100 Del.quantity cm3/ : 52.0...0.0 1000 s: (52.0...0.0) SET IDLE AUXILIARY SPRING rpm : 380 Speed Rack travel in mm: 4.7...4.9 : (4.6...5.0) Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version 1st speed : 1000 rpm 1st version Rack travel in m: 13.70...13.80 Aneroid pressure h: 1850 2nd speed : 1600 rpm rpm : 2500 Speed Rack travel in m: 13.00...13.20 Rack travel in mm : 8.50...8.90 Del.quantity cm3/: 29.0...33.0 1000 s: (28.0...34.0) 3rd speed rpm : 2200 Rack travel in m: 12.20...12.40 Spread cm3 : 2.50Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version Speed rpm : 315 Setting Rack travel in mm : 5.60...5.80 Speed : 1000 Del.quantity cm3/ : 5.0...6.0 LDW Pressure hPa : 1600 1000 s: (4.0...8.5) Rack travel mm : 0.30...0.70 cm3 : 1.00Spread 1000 s: (1.50) Measurement Speed 1/min: 1000 SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.40...3.60 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 4.90...5.30 rpm : 340 Speed Rack travel in mm : (12.6...14.0) Del.quantity cm3/: -1000 s: (41.0...49.0) FUEL DELIVERY CHARACTERISTICS Current A 1st version Aneroid pressure h: 1850 Control lever at full-load stop rpm : 1600 Speed Speed rpm : 2950 Del.quantity cm3/: 49.5...51.0 Rack travel in mm: 0.0...1.0 1000 s: (48.5...52.0) Current : 2.50 Spread cm3 short-duration A: 3.0 1000 s: (3.) Starting test Aneroid pressure h: 1850 Speed rpm Del.quantity cm3/: -min. 1000 s: 52.0 Speed : 2200 rpm Del.quantity cm3/: 48.5...50.5 1,8A 1000 s: (47.5...51.5) Remarks:

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE IDLE-SPEED AUXILIARY SPRING CUTOFF
—Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
—Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Pin projection = 16.60...16.70 mm

CORRECTION OF INJECTED—FUEL QUANTITY—Set max. change plus/minus 0.75 mm control—rod travel at correction screw on ALDA pressure box.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547 (2.457...2.577) V must be displayed on the digital voltmeter.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 18.5...19.5 17.50...20.5) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.487...

2.547 V must be attained.

Note remarks

Test sheet : MB

Edition : 28.10.92

Replaces

Test oil : ISO-4113

Combination no. : 0 400 075 944

Injection pump

Pump designation : PES5M55C32ORS177 EP type number : 0 410 055 974

Governor

Governor design. : RSF340/2300M64-12

: 0 420 021 127 Governer no.

Cust. part no. : T8

Customer-spec. information Customer : MB-PKW

Engine : 0M602A-USA MJ90

1st version kW : 92.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

: 0 688 901 111 assembly

Opening

pressure, bar : 144...150

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

: 1.70...1.80 Prestroke mm

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1 - 2 - 4 - 5 - 3

Phasina : 0-72-144-216-288

Tolerance $+ - ^{\circ} : 0.00 (1.00)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 13,70...13.80

Del.quantity cm3/ : 5.1...5.2

100 s: (5.0,...5.3)

Spread cm3 : 0.2

100 s: (0.3)

2nd speed rpm : 315.0 Rack travel in mm: 5.6...5.8 Del.quantity cm3/: 0.6...0.7

100 s: (0.5...0.9)

Spread cm3 : 0.1

100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000 Aneroid pressure h: 1850

Del.quantity : 51.7...52.7 1000 : (50.7...53.7)

: 2.50 Spread cm3

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0 3rd rack travel in: 8,5...8,9

Speed rpm : 2500 4th rack travel in: 2950

rpm : 0.00...1.00Speed

SET IDLE CONTROL LEVER

POSITION

rpm : 1000

Rack travel in mm : 1,7...1,8

LOW IDLE 1

Control lever

position degrees: 812 Setting point w/out bumper spring Speed rpm : 315 Rack travel in mm : 5.7 Testing: Speed rpm : 220 Minimum rack trave: 8.00 Speed rpm : 315 Rack travel in mm : 5.605.80 Speed rpm : 1000 Maximum rack trave: 1.80	Spread cm3: 2.50 1000 s: (3.00) Aneroid pressure h: 1050 Speed rpm: 1000 Del.quantity cm3/: 34.035.0 1000 s: (33.036.0) Spread cm3: 2.50 1000 s: (3.00) STARTING FUEL DELIVERY
SET IDLE AUXILIARY SPRING Speed rpm : 380 Rack travel in mm : 4,74,9 : (4,65,0)	Speed rpm : 100 Del.quantity cm3/: 54.0 1000 s: - Rack travel in mm : 20.1
TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 13.7013.80 2nd speed rpm : 1600 Rack travel in m: 13.0013.20 3rd speed rpm : 2200 Rack travel in m: 12.2012.40 Ameroid/Altitude Compensator Test	HIGH IDLE 1st version Aneroid pressure h: 1850 Speed rpm : 2500 Rack travel in mm : 8.508.90 Del.quantity cm3/: 30.034.0 1000 s: (29.035.0) Spread cm3 : 2.50 1000 s: (3.00) LOW IDLE
1st version Setting Speed rpm : 1000 Pressure hPa : 1600 Rack travel mm : 0.300.70 Measurement	Speed rpm: 315 Rack travel in mm: 5.605.80 Del.quantity cm3/: 6.07.0 1000 s: (5.09.5) Spread cm3: 1.00 1900 s: (1.50)
Speed 1/min: 1000 1st pressure hPa: 1050 Rack travel in m: 3.403.60	SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR)
2nd pressure hPa : 750 Rack travel in m: 4.905.30 FUEL DELIVERY CHARACTERISTICS 1st version	Control lever at idle stop Speed rpm : 340 Rack travel in mm : (12,614,0) Del.quantity cm3/: - 1000 s: (42,550,5) Current A : 1,8
Aneroid pressure h: 1850 Speed rpm : 1600 Del.quantity cm3/: 50.051.5 1000 s: (49.052.5) Spread cm3 : 2.50 1000 s: (3.0) Aneroid pressure h: 1850 Speed rpm : 2200 Del.quantity cm3/: 48.550.5 1000 s: (47.551.5)	Control lever at full-load stop Speed rpm : 2950 Rack travel in mm : 0,01,0 Current short-duration A : 3,0 Starting test Speed rpm : 100 Del.quantity cm3/: - min. 1000 s: 54,0 / 1,8A Remarks:

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Sliding sleeve pre-travel = 6.5 mm

CHECKING THE 1DLE-SPEED AUXILIARY SPRING CUTOFF
-Control-lever position 35,5°, max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.
-Control-lever position 33.0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

TESTING PNEUMATIC SHUTOFF DEVICE
-Control lever at idle stop.
With n = 315 1/min. and pu = 450 mbar,
control rod must move quickly to
control-rod travel = 0 mm

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

RWG adjustment

At engine speed of 1000 1/min set delivery rate of 19.0...20.0 (18.0...21.0) ccm/1000 strokes with control lever. Shift RWG until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws to 1...2 Nm. Move control lever to full-load stop; voltage value of 2.487...2.547 V must be attained.

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400
Receiving inspection
Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2.487...2.547

(2.457...2.577) V must be displayed on the digital voltmeter.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 01.09.92 Replaces : 14.10.91 Test oil : 1SO-4113 Combination no. : 0 400 076 968 Injection pump Pump designation : PES6M55C32ORS178 EP type number : 0 410 056 986 Governor Governor design. : RSF315/2125M64-13 Governer no. : 0 420 021 128 Customer-spec. information Customer : MB-PKW Engine : OM603A D35 USA ALDA 1st version kW : 100.0 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 469 990 351 Inlet press., bar: 1.00 Test nozzle holder assembly : 0 681 343 009 Opening pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant. per values BEGINNING OF DELIVERY Test pressure, bar: 30...32 Prestroke mm : 1.70...1.80 : (1.65...1.85) Rack travel in mm : 20.00...22.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300 Tolerance $+ - ^{\circ} : 0.00 (1.00)$ Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 1000 Rack travel in mm : 13.70...13.80 Del.quantity cm3/ : 5.8...5.9 100 s: (5.7...6.0) cm3 : 0.2Spread 100 s: (0.3) 2nd speed rpm : 290.0Rack travel in mm : 5.6...5.9 Del.quantity cm3/: 0.5...0.6 100 s: (0.5...0.9) Spread cm3 : 0.1100 s: (0.1) FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1000 Aneroid pressure h: 1850 : 58.0...59.0 Del.quantity 1000 : (57.0...60.0) Spread : 2.50 cm3 1000 : (3.00) RATED SPEED 1st version Control lever position degrees: 50...0 3rd rack travel in: 6.5...6.9 Speed rpm : 2300 4th rack travel in: 2700 Speed mqn : 0.00...1.00 SET IDLE CONTROL LEVER POSITION rpm : 1000 Rack travel in mm : 1,4...1,5LOW IDLE 1 Control lever position degrees: 8...12 Setting point w/out bumper spring

COM rpm : 1000Speed Rack travel in mm: 5.7 Del.quantity cm3/: 38.0...39.0 1000 s: (37.0...40.6) cm3 : 2.50 Testing: Spread rpm : 200 Speed 1000 s: (3.00) Minimum rack trave: 7.00 rpm : 290Speed Rack travel in mm : 5.60...5.90 STARTING FUEL DELIVERY rpm : 1000 Speed Maximum rack trave: 1.50 Speed rom : 100 Del.quantity cm3/: 52.0...0.0 1000 s: (52.0...0.0) SET IDLE AUXILIARY SPRING : 400 Speed rom Rack travel in mm : 3,60...3,70 Rack travel in mm : 20.10...0.00 : (3,50...3,80) HIGH IDLE TORQUE CONTROL Torque control curve - 1st version 1st version rpm : 1000 1st speed Aneroid pressure h: 1850 Rack travel in m: 13.70...13.80 rpm : 2300 Speed rpm : 1600 2nd speed Rack travel in mm : 6.50...6.90 Rack travel in m: 12.70...12.90 Del.quantity cm3/ : 22.0...26.0 3rd speed rpm : 2000 1000 s: (21.0...27.0) Rack travel in m: 11.30...11.50 cm3 : 2.50 Spread 1000 s: (3.00) Aneroid/Altitude Compensator Test LOW IDLE Speed rpm : 290 1st version Rack travel in mm : 5.60...5.90 Setting Del.quantity cm3/ : 5.5...6.5 Speed : 1000 mgn 1000 s: (5.0...9.5) Pressure hPa : 1600 Spread cm3 : 1.00Rack travel mm : 0.40...0.80 1000 s: (1.50) Measurement SETTING/TESTING ELECTRONIC IDLE Speed 1/min: 1000 REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.50...3.70 2nd pressure hPa : 750 Control lever at idle stop Speed rpm : 315 Rack travel in m: 5.00...5.40 Rack travel in mm : (11,7...13,1) Del.quantity cm3/: -FUEL DELIVERY CHARACTERISTICS 1000 s: (41,0...49,0) Current A : 1,8 1st version Control lever at full-load stop Aneroid pressure h: 1850 Speed CDM : 2700 rpm : 1600 Speed Rack travel in mm: 0,0...1,0 Del.quantity cm3/: 54.5...56.0 1000 s: (53.5...57.0) Current short-duration A: 3,0 cm3 : 2.50Spread Starting test 1000 s: (3.0) Aneroid pressure h: 1850 Speed rpm : 100 Del.quantity cm3/:-: 2000 Speed rpm min. 1000 s: 52.0 1,8A Del.quantity cm3/: 49.0...51.0 1000 s: (48.0...52.0) Remarks: cm3 : 2.50 Spread 1000 s: (3.00) Aneroid pressure h: 1050 Start-of-delivery sensor system:

adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

Adjustment of the control-rod travel sensor

At a speed of 1000 1/min, set fuel delivery at 22.0...23.0 (21.0...24.0) ccm/1000 strokes with control lever. Shift control-rod-travel sensor until U = 1.633...1.639 (1.635...1.637) V is indicated. Tighten fastening screws with 1...2 Nm. Control lever to full-load stop; voltage value of 2.472... 2.532 V must be attained.

Testing and adjusting the control-rodtravel sensor with evaluation circuit KDEP-P400

Receiving inspection
Shift control lever to full-load stop.
Set 13.5 V at stabilizer. Apply
1850 hPa to ALDA. Run up to speed of
1000 1/min; a voltage of 2.457...2.517
(2.427...2.547) V must be displayed
on the digital voltmeter.

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 44,5° max. 0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min. -Control-lever position 42,0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop. At n = 290 1/min and pu = 450 mbar control rod must move briskly to control-rod travel = 0 mm

Note remarks

Test sheet

: MB

Edition

: 29.10.92

Replaces Test oil

: 01.09.92 : ISO-4113

Combination no. : 0 400 076 968

Injection pump

EP type number

Pump designation : PES6M55C32DRS178 : 0 410 056 986

Governor

Governor design: : RSF315/2125M64-13

Governer no.

: 0 420 021 128

Cust. part no.

: T4

Customer-spec. information Customer

: MB-PKW

Engine

: OM603A D35 USA ALDA

1st version kW

: 100.0

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 469 990 351

Inlet press., bar: 1.00

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

× Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm

: 1.70...1.80

: (1.65...1.85)

Rack travel in mm : 20.00...22.00

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.00 (1.00)

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm : 1000

Rack travel in mm : 13.70...13.80

Del.quantity cm3/: 5.8...5.9

100 s: (5.7...6.0)

Spread

cm3 : 0.2

100 s: (0.3)

2nd speed

rpm : 290.0

Rack travel in mm : 5.6...5.9 Del.quantity cm3/: 0.5...0.6

100 s: (0.5...0.9)

Spread

cm3 : 0.1100 s: (0.1)

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1000

Aneroid pressure h: 1850

Del.quantity

: 58.0...59.0 1000 : (57.0...60.0) cm3 : 2.50

Spread

1000 : (3.00)

RATED SPEED

1st version

Control lever

position degrees: 50...0

3rd rack travel in: 6.5...6.9

Speed rpm : 2300

4th rack travel in: 2700

Speed

rpm : 0.00...1.00

SET IDLE CONTROL LEVER

POSITION

rpm : 1000

Rack travel in mm : 1,4...1,5

LOW IDLE 1

Control lever

K09

position degrees: 8...12 cm3 : 2.50Spread Setting point w/out bumper spring 1000 s: (3.00) rom : 290 Aneroid pressure h: 1050 Speed rpm : 1000
Del.quantity cm3/: 38.0 ..39.0
1000 s: (37.0...40.0)
Spread cm3 : 2.50 Rack travel in mm: 5.7 Testina: Speed rpm : 200 Minimum rack trave: 7.00 1000 s: (3.00) rpm : 290 Rack travel in mm : 5.60...5.90 Speed : 1000 r'iom STARTING FUEL DELIVERY Maximum rack trave: 1.50 SET IDLE AUXILIARY SPRING rpm : 100 Speed rpm : 400 Del.quantity cm3/: 52.0...0.0 Rack travel in mm : 3,60...4,10 1000 s: (52.0...0.0) : (3,50...4,20) Rack travel in mm : 20.10...0.00 TORQUE CONTROL HIGH IDLE Torque control curve - 1st version rpm : 1000 1st speed 1st version Rack travel in m: 13.70...13.80 Aneroid pressure h: 1850 rpm : 1600 2nd speed rpm : 2300 Rack travel in m: 12.70...12.90 Rack travel in mm : 6.50...6.90 Del.quantity cm3/: 22.0...26.0 1000 s: (21.0...27.0) Spread cm3 : 2.50 3rd speed rpm : 2000 Rack travel in m: 11.30...11.50 Aneroid/Altitude 1000 s: (3.00) Compensator Test LOW IDLE 1st version Speed rpm : 290 Setting Rack travel in mm : 5.60...5.90 Speed : 1000 Del.quantity cm3/: 5.5...6.5 rom Pressure hPa : 1600 1000 s: (5.0...9.5) cm3 : 1.00 1000 s: (1.50) Rack travel mm : 0.40...0.80 Spread Measurement $1/\min : 1000$ Speed SETTING/TESTING ELECTRONIC IDLE REGULATION (ELR) 1st pressure hPa : 1050 Rack travel in m: 3.50...3.70 2nd pressure hPa : 750 Control lever at idle stop Rack travel in m: 5.00...5.40 rpm : 315 Rack travel in mm: (11,7...13,1) Del.quantity cm3/: -1000 s: (41,0...49,0) FUEL DELIVERY CHARACTERISTICS Current A 1st version Aneroid pressure h: 1850 Control lever at full-load stop Speed rpm : 1600 Del.quantity cm3/ : 54.5...56.0 Speed rpm : 2700 Rack travel in mm : 0,0...1,01000 s: (53.5...57.0) Current Spread cm3 : 2.50short-duration A: 3,0 1000 s: (3.0) Starting test Aneroid pressure h: 1850 Speed rpm : 100 rpm : 2000 Speed Del.quantity cm3/: -Del.quantity cm3/: 49.0...51.0 1000 s: (48.0...52.0) 1000 s: 52,0 1,8A Remarks:

Start-of-delivery sensor system: adjustment and blocking with device KDEP 1077 = 16.8°...17.2° (16.7...17.3°) angular displacement of cam following start of delivery of cylinder no. 1.

Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

CORRECTION OF INJECTED-FUEL QUANTITY -Set max. change plus/minus 0.75 mm control-rod travel at correction screw on ALDA pressure box.

* RWG testing and adjustment with evaluation circuit KDEP-P400 incoming inspection
Position control lever against full-load stop. Set 13.5 V on regulator. Apply 1850 hPa to ALDA. Approach engine speed of 1000 1/min; in doing so, digital voltmeter must indicate a voltage of 2.432...2.502 (2.462...2.482) V.

RWG adjustment

At engine speed of 1000 1/min set delivery rate of 22.0...23.0 (21.0...24.0) ccm/1000 strokes with control lever. Shift RWG until U = 1.633...1.639 (1.635...1.637)V is indicated. Tighten fastening screws to 1...2 Nm. Move control lever to full-load stop; voltage value of 2.432...2.502 V must be attained.

Sliding sleeve pre-travel = 5.5 mm

CHECKING THE IDLE—SPEED AUXILIARY SPRING CUTOFF

-Control-lever position 44,5° max.

0.2 mm control-rod travel deduction allowable after switchover point (of starting cam) up to 1000 1/min.

-Control-lever position 42,0°, control-rod travel deduction must be greater than 0.2 mm after switchover point (of starting cam).

CHECKING THE PNEUMATIC SHUTOFF BOX -Control lever up against idle stop.

At n = 290 1/min and bu = 450 mban control rod must move briskly to control-rod travel = 0 mm

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : DEE Edition : 26.02.93 Replaces Test oil : ISO-4113 Combination no. : 0 400 876 411 Injection pump Pump designation : PES6A1000410RS2762-1 EP type number : 0 410 806 008 Governor Governor design. : RSV425...1100A0c2252 -2L Governer no. : 0 420 232 591 Customer-spec. information Customer : JOHN DEERE Engine : 6076ADW-30 : 135.0 1st version kW Rated speed : 2200 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 457 413 010 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 101 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,6 Test lines : 1 680 750 008 Outside diameter x Wall thickness : 6.00x2.00x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values _

: 2.95...3.05 Prescroke mi : (2.90...3.10) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 1100Rack travel in mm : 11.10...11.20 Del.quantity cm3/: 10.4...10.6 100 s: (10.2...10.8) Spread cm3 : 0.4100 s: (0.6) rpm : 425.0 2nd speed Rack travel in mm: 6.0...6.2 Del.quantity cm3/: 3.1...3.5 100 s: (2.9...3.7) cm3 : 0.6Spread 100 s: (0.8) GUIDE SLEEVE POSITION Control-lever position Degree: -3 rpm : 800 Speed Rack travel in mm : 0.30...0.70 Governor spring pre-tension Click setting x : 4.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 : 104.5...106.5 Del.quantity 1000 : (102.5...108.5) cm3 : 4.00 Spread 1000 : (6.50) RATED SPEED 1st version Control lever position degrees: 45...53 Testing:

BEGINNING OF DELIVERY

Test pressure, bar: 27...29

1st rack travel in: 10.10

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

Speed rpm : 1205...1215

3rd rack travel in: 4.00

Speed rpm: 1195...1225 4th rack travel in: 1350

rpm : 0.30...1.40Speed

LOW IDLE 1 Control Lever

position degrees: 21...29

Setting point w/out bumper spring

Speed rpm : 425 Rack travel in mm: 5.6

Testina:

Speed : 100 rom

Minimum rack trave: 19.00

: 425 LDU.

Rack travel in mm : 6.00...6.20

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100 Rack travel in m: 11.10...11.20

: 700 2nd speed rpm

Rack travel in m: 13.50...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700 Del.quantity cm3/ : 141.0...145.0 1000 s: (139.0...147.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 100.0...120.0 1000 s: (95.0...125.0)

LOW IDLE

Speed : 425 rpm

Rack travel in mm : 6.00...6.20

Del.quantity cm3/: 31.0...35.0

1000 s: (29.0...37.0)

Spread cm3 : 6.00

1000 s: (8.00)

Remarks:

: JOHN DEERE # RE55529

Start-of-delivery mark = 13,5° after

start of delivery cyl. 1.

Adjustment without torque-control spring retainer with 0,5 mm less control-rod travel. Increase in full-load delivery with torque-control

spring retainer.

K13

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 3.70...3.80 : (3.65...3.85) Note remarks Rack travel in mm : 14.50...15.50 Firing order Test sheet : MAN 11,9 v Edition : 27.05.91 : 06.90 Replaces Test oil : ISO-4113 Phasing Combination no. : 0 402 036 738 Tolerance + - ° Injection pump Pump designation : PES6P120A720/3LS3254 EP type number : 0 412 026 739 BASIC SETTING Governor Governor design. : RQV300...950PA959 1st speed Governer no. : 0 421 813 860 Customer-spec. information Customer : MAN Engine : D2866LF02 ist version kW : 250.0 Spread Rated speed : 1900 TEST BENCH REQUIREMENTS 2nd speed Test oil inlet temp. °C : 38...42 Overflow valve Spread : 1 417 413 025 Inlet press., bar: 1.50 with governor Test nozzle holder assembly : 1 688 901 019 GUIDE SLEEVE TRAVEL 1st speed **Opening** travel mm : 207...210 pressure, bar 2nd speed travel mm Orifice plate 3rd speed rpm diameter mm : 0,8 travel mm 4th speed rpm travel mm Test lines : 1 680 750 067 5th speed rpm travel nm Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000 (A) Injection pump setting values

: 6-2-4-1-5-3 : 0-60-120-180-240-300 : 0.50 (0.75) Time to cyl. no. : 6 rom : 700Rack travel in mm : 15.00...15.10 Del.quantity cm3/: 24.2...24.4 100 s: (23.9...24.7) cm3 : 0.5100 s: (0.9) rpm : 300.0Rack travel in mm: 4.7...5.1 Del.quantity cm3/: 1.7...2.3 100 s: (1.4...2.6) cm3 : 0.8100 s: (1.2) (B) Setting of injection pump rpm : 995 : 9.70...9.90 rpm : 300: 0.90...1.10 : 500 : 3.40...4.00 : 750 : 6.60...7.00 : 1250 : 13.00...14.00 GUIDE SLEEVE POSITION Control-Lever position Degree: -1 rpm : 1025 Speed Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version rpm : 700 Speed Aneroid pressure h: 1200

Insp. values in parentheses Set equal delivery quant.

per values

Test pressure, bar: 30...32

BEGINNING OF DELIVERY

Del.quantity : 242.0...244.0 1000 : (239.0...247.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control Lever

position degrees: 298...306

Testina:

1st rack travel in: 13.50 rpm : 990...1000 Speed

2nd rack travel in: 4.00 rpm : 1080...1110 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 254...262

Testina:

Speed rpm : 200 Minimum rack trave: 6.40 Speed COM

Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

rpm : 320...430 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rpm Pressure hPa : 1200

Rack travel mm : 15.00...15.10

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 11.60...11.80

2nd pressure hPa : 110 Rack travel in m: 12.00...12.10

3rd pressure hPa : 470

Rack travel in m: 13.70...14.10

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

K15

Aneroid pressure h: 1200

Speed rpm : 950 Del.quantity cm3/ : 228.0...234.0 1000 s: (225.0...237.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 134.0...136.0

1000 s: (131.0...139.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 990...1000

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 215.0...235.0 1000 s: (211.0...239.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.70...5.10

Del.quantity cm3/: 17.0...23.0

1000 s: (14.0...26.0)

cm3 : 8.00 Spread

1000 s: (12.00)

Remarks:

: MAN-NR. 2-7942

Setting and blocking of pointer of start-of-delivery sensor on cyl. 6

start of delivery

Note remarks

Test sheet : SCA 14,0 h2 : 26.02.93 Edition Replaces : 02.89

Test oil : ISO-4113

Combination no. : 0 402 648 839

Injection pump

Pump designation : PE8P120A920/4LS7125T

EP type number : 0 412 628 824

Governor

Governor design. : RQV200...950PA736-1

Governer no. : 0 421 813 551

Customer-spec. information

Customer : SAAB-SCANIA

Engine : DSC14 03

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder

: 1 688 901 019 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 5.00...5.10 Prestroke mm

: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-6 - 8

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.80...13.90

Del.quantity cm3/: 22.1...22.3

100 s: (21.8...22.6)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 225.02nd speed Rack travel in mm : 4.9...5.3

Del.guantity cm3/: 1.6...2.0 100 s: (-)

cm3 : 0.3

Spread 100 s: (0.6)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

: 2.30...2.90 travel mm

3rd speed rpm : 650

travel mm : 4.40...5.00

995 4th speed rpm

: 7.70...7.90 travel mm

5th speed CDM

: 9.30...9.70 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1040

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 221.0...223.0 1000 : (218.0...226.0)

K16

Spread : 6.00 cm3 **1000** : (9.00)

RATED SPEED

1st version Control lever

position degrees: 91...99

Testing:

1st rack travel in: 12.80 Speed rpm : 990...1000 2nd rack travel in: 4.00

rpm : 1110,...1140 Speed 4th rack travel in: 1250

rom : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 40...48

Testing:

Speed rpm : 125 Minimum rack trave: 6.00 mpm : 225

Rack travel in mm : 4.90...5.10

Rack travel in mm: 2.00 Speed roni : 360...420

Aneroid/Altitude Compensator Test

1st version Setting

Speed rom : 500 hPa : 900 Pressure

Rack travel mm : 13.80...13.90

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 11.20...11.60

2nd pressure hPa : 365

Rack travel in m: 12.80...12.90

3rd pressure hPa : 215

Rack travel in m: 11.90...12.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 950 Del.quantity cm3/ : 211.0...219.0

1000 s: (209.0...221.0)

Aneroid pressure h: -: 500 Speed rom

Del.quantity cm3/: 158.0...162.0

1000 s: (156.0...164.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.80 rpm : 990...1000 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 240.0...290.0 1000 s: (-)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 225

Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension $3.2...3.4 \, \text{mm}$.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : SCA 14,2 m1 Edition : 26.02.93 Replaces : 02.90 Test oil : ISO-4113 Combination no. : 0 402 648 868 Injection pump Pump designation : PE8P120A920/4LS7180 EP type number : 0 412 628 837 Governor Governor design. : RQV350...1050PA795-8 : 0 421 813 770 Governer no. Customer-spec, information Customer : SCANIA Engine : DSI 14 TEST BENCH REQUIREMENTS Test oil : 38...42 inlet temp. °C Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 015 Outside diameter x Wall thickness x Length mm : 6.00x1.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____ BEGINNING OF DELIVERY Test pressure, bar: 25...27

: 5.00...5.10

Rack travel in mm : 9.00...12.00

: (4.95...5.15)

: 1- 2- 7- 3- 4- 5-Firing order 6-8 : 0-45-90-135-180-225-Phasing 270-315 : 0.50 (0.75) Tolerance + - ° Time to cyl. no. : 1 BASIC SETTING 1st speed rpm : 700Rack travel in mm : 13.20...13.30 Del.quantity cm3/: 26.8...27.0 100 s: (26.5...27.3) cm3 : 0.7Spread 100 s: (1.0) 2nd speed rpm : 350.0Rack travel in mm: 4.5...4.9 Del.quantity cm3/ : 1.5...1.9 100 s: (-) Spread cm3 : 0.3100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 350 2nd speed : 1.30...1.70 travel mm 3rd speed rpm : 650 : 4.10...4.70 travel mm 4th speed rpm : 1145 : 7.80...8.00 travel mm 5th speed : 1255 rpm : 8.80...9.20 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1325 Speed Rack travel in mm : 6.00...11.00 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 700 Aneroid pressure h: 900 Del.quantity : 268.0...270.0 1000 : (265.0...273.0) : 7.00 cm3 Spread

1000 : (10.00)

Prestroke mm

RATED SPEED

1st version Control lever

position degrees: 98...106

Testing:

1st rack travel in: 12.20

npm : 1090...1100 Speed

2nd rack travel in: 4.00

Speed rpm : 1215...1245 4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 68...76

Testina:

Speed rpm : 250 Minimum rack trave: 6.00

Speed rpm: 350

Rack travel in mm : 4.50...4.70 Rack travel in mm : 2.00

rpm : 370...430 Speed

Aneroid/Altitude Compensator Test

1st version Settina

Speed rpm : 500 hPa : 900 Pressure

Rack travel mm : 13.20...13.30

Measurement

Speed $1/\min: 500$

1st pressure hPa : -

Rack travel in m: 9.70...10.10

2nd pressure hPa : 365

Rack travel in m: 11.80...11.90

3rd pressure hPa : 215

Rack travel in m: 10.80,...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900 rpm : 1050

Del.quantity cm3/: 258.0...266.0

1000 s: (256.0...268.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 158.0...162.0 1000 s: (156.0...164.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 110.0...150.0

1000 s: (-)

Rack travel in mm : 9.70...10.10

LOW IDLE

rpm : 350

Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 nm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

diaphragm.

BOSCH INJ. PUMP TEST SPECIFICATIONS : 5.00...5.10 : (4.95...5.15) Prestroke mm Rack travel in mm : 9.00...12.00 Firing order : 1-2-7-3-4-5-Note remarks Test sheet : SCA 14,2 o 6-8 Edition : 26.02.93 Replaces : 10.92 Test oil : ISO-4113 Phasing : 0-45-90-135-180-225-Combination no. : 0 402 648 891 270-315 : 0.50 (0.75) Tolerance + - ° Injection pump Pump designation : PE8P120A920/4LS71890 Time to cyl. no. : 1 EP type number : 0 412 628 858 Governor BASIC SETTING Governor design: RQV200...950PA736-8 Governer no. : 0 421 813 315 1st speed rpm: 700 Customer-spec, information Rack travel in mm : 12.30...12.40 Customer : SCANIA Del.quantity cm3/: 21.9...22.1 Engine : DSC14 08 100 s: (21.6...22.4) TEST BENCH REQUIREMENTS Spread cm3 : 0.8Test oil inlet temp. °C : 38...42 100 s: (1.2) Overflow valve rpm : 250.0 2nd speed : 1 417 413 025 Rack travel in mm : 4.4...4.8 Del.quantity cm3/: 1.2...1.6 Inlet press., bar: 2.30 100 s: (-) Spread cm3 : 0.4Overflow 100 s: (0.8) quantity min. 1/h: 170...0 (B) Setting of injection pump Test nozzle holder with governor : 1 688 901 104 assembly GUIDE SLEEVE TRAVEL Opening 1st speed rpm : 250 pressure, bar : 250...253 : 1.40...1.80 travel mm 2nd speed rpm : 350 Orifice plate travel mm : 2.30...2.90 3rd speed diameter mm : 0,7 rpm : 650 travel mm : 4.40...5.00 : 995 4th speed rpm Test lines : 1 680 750 008 : 7.70...7.90 travel mm : 1115 5th speed rpm Outside diameter : 9.20...9.60 travel mm x Wall thickness x Length mm : 6.00x2.00x600 GUIDE SLEEVE POSITION Control-lever position (A) Injection pump setting values Degree: -1 rpm : 1150 Insp. values in parentheses Set equal delivery quant. Rack travel in mm : 7.00...12.00 per values ____ FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY Test pressure, bar: 25...27 1st version

Speed

rpm : 700

Ameroid pressure h. 900

Del.quantity : 219.0...221.0

1000 : (216.0...224.0)

: 8.00 cm3 Spread

1000 : (12.00)

RATED SPEED

1st version Control lever

position degrees: 90...98

Testina:

1st rack travel in: 11.30

rpm : 990...1000 Speed

2nd rack travel in: 4.00

Speed rpm : 1090...1120 4th rack travel in: 1250

Speed nom : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 41...49

Testing:

rpm : 150 Speed Minimum rack trave: 5.80 Speed rpm : 250 Rack travel in mm : 4.40...4.60

Rack travel in mm : 2.00

rpm : 375...435 Speed

Aneroid/Altitude Compensator Test

1st version

Settina

Speed rom : 500 Pressure hPa : 900

Rack travel mm : 12.30...12.40

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.20

2nd pressure hPa : 525
Rack travel in m: 11.70...11.80
3rd pressure hPa : 320
Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

rpm : 950 Speed

Del.quantity cm3/: 202.0...210.0 1000 s: (200.0...212.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 142.0...146.0 1000 s: (140.0...148.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.30

Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 130.0...180.0

1000 s: (-)

Rack travel in mm : 9.80...10.20

LOW IDLE

rpm : 250 Speed

Rack travel in mm : 4.40...4.60

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders

to 2.9...3.1 mm.

Start-of-delivery setting with ROBO

diaphragm.

Note remarks

Test sheet

: MB

Edition

: 26.02.93

Replaces

: 08.92

Test oil

: ISO-4113

Combination no.

: 0 402 648 895x

Injection pump

Pump designation : PE8P12OA320LS7835-10

EP type number

: 0 412 628 853

Governor

Governor design. : RQ300/1050PA972-1

Governer no.

: 0 421 801 545

Cust. part no.

: 0180742102

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M402 LA

1st version kW

: 280.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm: 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed

rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

Spread

cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 300

1.70...1.90

travel mm 2nd speed

rpm : 510

travel mm 3rd speed

: 5.90...6.10 rpm : 845

travel mm

: 6.30...6.50

4th speed travel mm rpm : 1109

: 6.70...6.90 : 1270

5th speed travel mm

rpm

: 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750Aneroid pressure h: 1200

Del.quantity

230.0...232.0 1000 : (227.0...235.0)

cm3 : 6.00 1000 : (9.06) Spread

RATED SPEED

1st version

Setting point:

Speed rpm Rack travel in mm: 20.0

Testina:

1st rack travel in: 13.00

Speed rpm : 1090...1105

2nd rack travel in: 4.00

rpm : 1170...1200 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm : 6.2

Testing:

Speed rom : 200 Minimum rack trave: 7.80 : 300 rpm

Rack travel in mm : 6.10...6.30

Rack travel in mm : 2.00

: 380...420 Speed rom

TORQUE CONTROL

Dimension a mm : 0.50 : 1050 2nd speed rom

Rack travel in m: 13.90...14.10

3rd speed rpm : 800

Rack travel in m: 14.60...14.80

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm hPa : Pressure

: 10.30...10.60 Rack travel mm

Measurement

1/min : 500 **Speed**

1st pressure hPa : 250

Rack travel in m: 11.20...11.30

2nd pressure hPa : 600

Rack travel in m: 13.50...13.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 1050

Del.quantity cm3/: 214.0...217.0

1000 s: (211.0...220.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 131.0...133.0

1000 s: (128.0...136.0)

cm3 : 8.00Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 40.0...70.0

1000 s: (36.0...74.0)

Remarks:

Note remarks

Test sheet : FIA 17,2 f Edition : 01.03.93 : 01.93 Replaces Test oil : ISO-4113

Combination no. : 0 402 648 912

Injection pump

Pump designation : PE8P130A920/5LS7841

EP type number : 0 412 638 803

Governor

Governor design. : RQV300...950PA994K

: 0 421 815 275 Governer no.

Customer-spec. information Customer : IVECO-FIAT

Engine : 8280.42.050

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening |

pressure, bar : 207 . 210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15)

Rack travel in mm: 11.50...12.50

Firing order : 1-8-4-3-6-5-

Phasing : C-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 11.50...12.50

& maximum rack tra: 21.00 Difference °CS : 1.25...2.75

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 10.50...10.60

Del.quantity cm3/: 21.4...21.6

100 s: (21.1...21.9)

cm3 : 0.8 Spread

100 s: (1.2)

2nd speed rpm : 300.0Rack travel in mm: 4.0...4.4 Del.quantity cm3/: 2.2...2.8

100 s: (1.9...3.1)

cm3 : 0.5Spread 100 s: (0.9)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed

: 9.60...9.80 travel mm

rpm : 300 2nd speed

: 2.50...2.70 travel mm

3rd speed rpm : 500

travel mm : 4.10...4.70

4th speed : 700 man

travel mm : 5.90...6.50

rpm : 1250 5th speed

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1080 Speed

Rack travel in mm : 8.10...10.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 550 Aneroid pressure h: 900 Del.quantity : 214.0...216.0 1000 : (211.0...219.0) cm3 : 8.00 Spread 1000 : (12,00) RATED SPEED 1st version Control lever position degrees: 108...116 Testing: 1st rack travel in: 9.40 Speed rpm : 990...1000 2nd rack travel in: 4.00 Speed rpm : 1035...1065 4th rack travel in: 1200 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 58...66 Testing: Speed rpm : 200 Minimum rack trave: 5.70 Speed rpm : 300 Rack travel in mm : 4.10...4.30 CONSTANT REGULATION Speed rpm : 170...290 TORQUE CONTROL Torque control curve - 1st version st speed rpm : 550 Rack travel in m: 10.50...10.60 1st speed 2nd speed rpm : 950 Rack travel in m: 10.40...10.60 3rd speed rom : 700 Rack travel in m: 10.40...10.70 4th speed rpm : 350 Rack travel in m: 10.00...10.30 Aneroid/Altitude Compensator Test 1st version Setting Speed rpm : 950 hPa : 900 Pressure Rack travel mm : 10.50...10.60 Measurement

1/min: 950

1st pressure hPa : -Rack travel in m: 7.30...7.50 2nd pressure hPa : 360 Rack travel in m: 9.70...9.80 3rd pressure hPa : 260 Rack travel in m: 8.10...8.30 START CUT-OUT 1/min: 220 (240) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 Speed rpm : 950 Del.quantity cm3/: 214.0...220.0 1000 s: (211.0...223.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 139.0...141.0 1000 s: (136.0...144.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.40 rpm : 990...1000 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 150.0...180.0 1000 s: (146.0...184.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 4.00...4.40 Del.quantity cm3/: 22.0...28.0 1000 s: (19.0...31.0) Spread cm3 : 5.001000 s: (9.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet : FIA : 01.03.93 Edition Replaces : 07.92 : ISO-4113 Test oil

Combination no. : 0 402 648 913

Injection pump

Pump designation : PE8P130A920/5LS7841 EP type number : 0 412 638 803

Governor

Governor design: : RQV250...950PA994-1K

Governer no. : 0 421 815 276

Customer-spec. information Customer : IVECO-FIAT

Engine : 8280.42.350 SPR

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 105 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10 : (4.95...5.15) Rack travel in mm : 11.50...12.50

: 1- 8- 4- 3- 6- 5-7- 2 Firing order

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 11.50...1.50

& maximum rack tra: 21.00

Difference ° CS : 1.25...2.75

BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 10.90...11.00

Del.quantity cm3/: 22.1...22.3

100 s: (21.8...22.6)

Spread cm3 : 0.8

100 s: (1.2)

rpm : 300.0 2nd speed Rack travel in mm: 4.0...4.4 Del.quantity cm3/: 2.2...2.8

100 s: (1.9...3.1)

cm3 : 0.5 Spread 100 s: (0.9)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 995 1st speed

: 9.60...9.80 travel mm

2nd speed man : 300

travel mm : 2.50...2.70

3rd speed : 500 rpm

: 4.10...4.70 travel mm

4th speed : 700 rpm

: 5.90...6.50 travel mm

5th speed rpm : 1250

travel mm : 13.00...14.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1070 Speed

Rack travel in mm : 9.10...11.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 550 Aneroid pressure h: 900 Del.quantity : 221.0...226.0) cm3 : 8.00 1000 : (12.00) Spread RATED SPEED 1st version Control lever position degrees: 110...118 Testing: 1st rack travel in: 10.60 rpm : 990...1000 Speed 2nd rack travel in: 4.00 rpm : 1055...1085 4th rack travel in: 1250 Speed rpm : 0.00...1.00 LOW IDLE 1 Control lever position degrees: 58...66 Testing: Speed rpm : 200 Minimum rack trave: 5.70 rpm : 300 Rack travel in mm : 4.10...4.30 CONSTANT REGULATION Speed rpm : 170...290 TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 550 Rack travel in m: 10.90...11.00 rpm : 950 2nd speed Rack travel in m: 11.60...11.80 3rd speed rpm : 700 Rack travel in m: 11.30...11.60 4th speed rpm : 400 Rack travel in m: 10.50...10.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 950 **LDW** hPa : 900 Pressure : 11.60...11.80 Rack travel mm Measurement 1/min: 950 Speed

1st pressure hPa : -Rack travel in m: 7.80...8.00 2nd pressure hPa : 450 Rack travel in m: 11.20...11.30 3rd pressure hPa : 280 Rack travel in m: 8.70...9.10 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 900 rpm : 950 Del.quantity cm3/: 247.0...254.0 1000 s: (244.0...257.0) Aneroid pressure h: -Speed rpm : 550 Del.quantity cm3/: 147.0...149.0 1000 s: (144.0...152.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 10.60 rpm : 990...1000 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 150.0...180.0 1000 s: (146.0...184.0) LOW IDLE Speed rpm : 300 Rack travel in mm : 4.00...4.40 Del.quantity cm3/: 22.0...28.0 1000 s: (19.0...31.0) Spread cm3 : 5.00 1000 s: (9.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Note remarks

Test sheet

: M8

Edition

: 26.02.93

Replaces

: 08.92

Test oil

: ISO-4113

Combination no. : 0 402 648 914X

Injection pump

Pump designation: PE8P120A320LS7835-10

EP type number

: 0 412 628 853

Governor

Governor design.

: RQV300...1050PA797

-30

Governer no.

: 0 421 813 921

Cust. part no.

: 0180742202

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M402 A

1st version kw

: 280.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2,50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00

Firing order : 8-7-2-6-3-5-

Firing order

: 4- 1

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

rpm : 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread

cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 5.9...6.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread

100 s: (1.0)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm

: 1.00...1.50

2nd speed travel mm

rpm : 608

: 4.80...5.30

3rd speed

rpm : 820

travel mm

: 5.90...6.40

rpm

: 1108

4th speed travel mm

: 8.10...8.60

1190

5th speed rpm

travel mm

: 9.80...10.30

GUIDE SLEEVE POSITION

Control-lever position

Degree: -1 rpm : 1130 Speed Rack travel in mm : 12.60...15.20 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 750 Aneroid pressure h: 1200 : 230.0...232.0 Del.quantity 1000 : (227.0...235.0) cm3 Spread : 6.00 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 118...126 Testing: 1st rack travel in: 13.00 rpm : 1090...1100 Speed 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 rpm : 0.00...1.40 Speed LOW IDLE 1 Control lever position degrees: 82...90 Testing: Speed rpm : 200 Minimum rack trave: 7.80 rpm : 300 Rack travel in mm : 6.10...6.30 CONSTANT REGULATION rpm : 300...500 Speed TORQUE CONTROL Dimension a mm : 0.60 2nd speed rpm : 1050 Rack travel in m: 13.90...14.10 3rd speed rpm : 800 Rack travel in m: 14.60...14.80 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 mc Pressure hPa : -

1st pressure hPa : 250 Rack travel in m: 11.20...11.30 2nd pressure hPa : 600 Rack travel in m: 13.30...13.70 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 1050 Del.quantity cm3/: 214.0...217.0 1000 s: (211.0...220.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 131.0...133.0 1000 s: (128.0...136.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 13.00 rpm : 1090...1100 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 200.0...230.0 1000 s: (196.0...234.0) Remarks:

L01

Rack travel mm

Measurement Speed : 10.30...10.60

1/min: 500

Note remarks

Test sheet : MB

: 26.02.93 Edition Replaces : 08.92

Test oil : ISO-4113

Combination no. : 0 402 648 915X

Injection pump

Pump designation : PE8P120A320LS7835-10

EP type number : 0 412 628 853

Governor

Governor design. : RQ300/1050PA993-1

: 0 421 801 582 Governer no.

Cust. part no. : 0200747202

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M402 LA

1st version kW : 280.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter

x Wall thickness

: 8.00x2,50x1000 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65) Rack travel in mm : 20.00...21.00

Firing order . : 8- 7- 2- 6- 3- 5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 14.60...14.80

Del.quantity cm3/: 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.6

100 s: (0.9)

rpm : 300.02nd speed

Rack travel in mm : 5.9...6.5 Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 750 Aneroid pressure h: 1200

: 230.0...232.0 Del.quantity

1000 : (227.0...235.0)

Spread : 6.00 cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600 Rack travel in mm: 20.0

Testina:

1st rack travel in: 13.00

Speed rpm : 1090...1105 2nd rack travel in: 4.00

Speed rpm: 1170...1200 4th rack travel in: 1300

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

rpm : 300

Rack travel in mm: 6.2

Testina:

rpm : 200 Speed Minimum rack trave: 7.80

rpm : 300 Speed

Rack travel in mm : 6.10...6.30

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : 0.50

2nd speed rpm : 1050

Rack travel in m: 13.90...14.10

3rd speed rpm : 800

Rack travel in m: 14.60...14.80

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rom

hPa : -Pressure

Rack travel mm : 10.30...10.60

Measurement

Speed $1/\min : 500$

1st pressure hPa : 250

Rack travel in m: 11.20...11.30

2nd pressure hPa : 600

Rack travel in m: 13.50...13.70

START CUT-OUT

1/min : 220 (240) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 1050 Speed

Del.quantity cm3/: 214.0...217.0 1000 s: (211.0...220.0)

cm3 : 8.00 Spread

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/: 131.0...133.0

1000 s: (128.0...136.0) cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

Spread

1st version

1mm rack travel less than

full load rack tr: 13.00

rpm : 1090...1105 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm

Del.quantity cm3/: 200.0...230.0

1000 s: (196.0...234.0)

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 26.02.93 Replaces Test oil : ISO-4113 Combination no. : 0 402 648 929A Injection pump Pump designation : PE8P120A320LS7847 EP type number : 0 412 628 863 Governor Governor design. : RQV300...950PA1033-1 Governer no. : 0 421 813 991 Cust. part no. : 0230741402 Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M402 LA 1st version kW : 280.0 Rated speed : 1900 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Openina pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075

Ourtside diameter x Wall thickness x Length mm : 8.00x2.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____ BEGINNING OF DELIVERY L04

Test pressure, bar: 25...27 Prestroke mm : 5.50...5.60 : (5.45...5.65) Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-: 0-45-90-135-180-225-Phasing 270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rpm : /ധി Rack travel in mm : 13.40...13.50 Del.quantity cm3/: 23.3...23.5 100 s: (23.0...23.8) Spread cm3 : 0.6100 s: (0.9) 2nd speed rpm : 300.0Rack travel in mm: 5.2...5.8 Del.quantity cm3/: 1.0...1.6100 s: (0.7...1.9) Spread cm3 : 0.8100 s: (1.0) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 300 : 1.10...1.50 travel mm rpm : 5672nd speed : 4.40...5.00 travel mm 3rd speed rpm : 780 travel mm : 6.00...6.60 rpm : 1010 4th speed : 8.50...8.70 travel mm : 1190 5th speed rom : 11.00...12.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1080 Rack travel in mm : 10.70...13.30 FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed Ameroid pressure h: 1200

rpm : 700

Del.quantity : 253.0...238.0)

cm3 : 6.00 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 116...124

Testing:

1st rack travel in: 11.80

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

Speed rpm : 1145...1170 4th rack travel in: 1350

rpm : 0.00...1.50 Speed

LOW IDLE 1 Control Lever

position degrees: 82...90

Testing:

Speed rpm : 200 Minimum rack trave: 7.60

Speed rpm : 300 Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 300...450

TORQUE CONTROL

Dimension a mm : 0.50

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 12.80...13.00 2nd speed rpm : 800

Rack travel in m: 13.40...13.60

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rom Pressure hPa : -

Rack travel mm : 10.30...10.60

Measurement

1/min: 500 Speed

1st pressure hPa : 300

Rack travel in m: 10.90...11.00

2nd pressure hPa : 650

Rack travel in m: 12.40...12.60

START CUT-OUT

Speed 1/min: 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 1050

Del.quantity cm3/: 206.0...209.0

1000 s: (203.0...212.0)

Spread cm3: 8.00

1000 s: (12.0)

Aneroid pressure h: -Speed

rpm : 500 Del.quantity cm3/: 131.0...133.0

1000 s: (128.0...136.0)

cm3 : 8.00 Spread

1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 11.80

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

rpm : 100

Del.quantity cm3/: 250.0...290.0

1000 s: (246.0...294.0)

Remarks:

L05

Note remarks

Test sheet : M

Edition : 26.02.93 Replaces : 01.93 Test oil : ISO-4113

Combination no. : 0 402 648 930

Injection pump

Pump designation : PE8P12OA32OLS7847 EP type number : 0 412 628 863

Governor

Governor design. : RQ300/1050PA1031-2

Governer no. : 0 421 801 645

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M402 LA

1st version kW : 280.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 105

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60

: (5.45...5.65)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

4-1

Phasing : 0-45-90-135-180-225-

270-315

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. :8

BASIC SETTING

1st speed rpm: 700

Rack travel in mm : 13.40...13.50

Del.quantity cm3/: 23.3...23.5

100 s: (23.0...23.8)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.8 Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.6

100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 700 Aneroid pressure h: 1200

Del.quantity : 233.0...235.0

1000 : (230.0...238.0)

Spread cm3 : 6.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm: 600

Rack travel in mm: 20.0 Testing: 1st rack travel in: 11.80 Speed rpm : 1090...1105 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1350 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm: 5.5 Testing: Speed rpm : 200 Minimum rack trave: 7.60 : 300 r)Om Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 Speed rpm : 370...410 TORQUE CONTROL Dimension a mm : 0.50 Torque control curve - 1st version 1st speed rpm : 700 Rack travel in m: 13.40...13.50 2nd speed rpm : 1050 Rack travel in m: 12.80...13.00 3rd speed rpm : 800 Rack travel in m: 13.40...13.50 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 500 Pressure hPa : -: 10.30...10.60 Rack travel mm Measurement Speed $1/\min : 500$ 1st pressure hPa : 300 Rack travel in m: 11.10...11.20 2nd pressure hPa : 650 Rack travel in m: 12.60...12.80 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version

Speed rpm : 1050 Del.quantity cm3/: 206.0...209.0 1000 s: (203.0...212.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 131.0...133.0 1000 s: (128.0...136.0) cm3 : 8.00 Spread 1000 s: (12.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 11.80 Speed rpm : 1090...1105 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 250.0...290.0

1000 s: (246.0...294.0)

Remarks:

L07

Aneroid pressure h: 1200

Note remarks

Test sheet : SCA

Edition : 26.02.93

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 943

Injection pump

Fump designation : PE8P12OA920/4LS7189

EP type number : 0 412 628 840

Governor

Governor design. : RQV350...1050PA795

-14

: 0 421 814 020 Governer no.

Customer-spec. information

Customer : SCANIA

Engine : DSC14

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 2.30

Overflow

quantity min. 1/h: 170...0

Test nozzle holder

: 1 688 901 104 assembly

Openina |

pressure, bar : 250...253

Orifice plate

diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10

: (4.95...5.15) Rack travel in mm : 9.00...12.00

: 1- 2- 7- 3- 4- 5-Firing order

6-8

: 0-45-90-135-180-225-Phasing

: 270-315 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 700

Rack travel in mm: 12.20...12.30

Del.quantity cm3/: 21.5...21.7

100 s: (21.2...22.0)

cm3 : 0.8Spread

100 s: (1.2)

2nd speed rpm : 350.0Rack travel in mm: 4.5...4.9

Del.quantity cm3/: 1.8...2.4

100 s: (-) cm3 : 0.4 Spread

100 s: (0.8)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

2nd speed rpm : 350

: 1.30...1.70 travel mm

3rd speed rpm : 650

: 4.10...4.70 travel mm

rpm : 1095 4th speed

: 7.80...8.00 travel mm

5th speed rpm : 1215

: 9.10...9.50 travel mm

GUIDE SLEEVE POSITION

Control-lever position

rpm : 1150

Rack travel in mm : 15.20...17.80

Degree: -1

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700Aneroid pressure h: 1500

L08

Del.quantity : 215.0...217.0

1000 : (212.0...220.0)

: 8.00 Spread cm3 1000 : (12.00)

RATED SPEED

1st version Control lever

position degrees: 102...110

Testing:

1st rack travel in: 11.20

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1180...1210 Speed

4th rack travel in: 1350

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 70...78

Testing:

Speed : 250 rpm Minimum rack trave: 7.50 rpm : 350

Rack travel in mm : 4.50...4.70

Rack travel in mm : 2.00 rom : 375...435 Speed

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rom hPa : 1500 Pressure

Rack travel mm : 12.20...12.30

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 9.80...10.20

2nd pressure hPa : 525

Rack travel in m: 11.70...11.80

3rd pressure hPa : 320

Rack travel in m: 10.40...10.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500 rpm : 1050 Speed

Del.quantity cm3/: 195.0...203.0

1000 s: (193.0...205.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/: 143.0...145.0

1000 s: (140.0...148.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.20

Speed rpm : 1090...1100

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...180.0

1000 s: (-)

Rack travel in mm : 9.80...10.20

LOW IDLE

Speed rpm : 350

Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring preload on new delivery-valve holders to 2.9...3.1 mm.

Start-of-delivery setting with ROBO diaphragm.

L09

Note remarks

Test sheet : MB

Edition : 05.02.93

Replaces

Test oil : ISO-4113

Combination no. : 0 402 648 948A

Injection pump

Pump designation : PE8P12OA320LS7859

EP type number : 0 412 628 869

Governor

Governor design. : RQ300/1050PA1030-7

Governer no. : 0 421 801 669

Customer-spec. information

Customen : MERCEDES-BENZ

Engine : OM442 LA

: 294.0 1st version kW Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 105 assembly

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00 Firing order : 8-7-2-6-3-5-

Phasing : 0-45-90-135-180-225-

270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed rpm: 1050

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 20.6...20.8

100 s: (20.3...21.1)

cm3 : 0.6Spread

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm: 4.9...5.5

Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.6Spread 100 s: (1.0)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1000

Del.quantity : 206.0...208.0

1000 : (203.0...211.0)

cm3 : 6.00 1000 : (9.00) Spread

RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0 Testing: 1st rack travel in: 11.70 Speed rpm : 1090...1105 2nd rack travel in: 4.00 rpm : 1170...1200 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring Speed rpm : 300 Rack travel in mm : 5.2 Testing: Speed rpm : 200 Minimum rack trave: 8.00 Speed rpm : 300 Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00 rpm : 360...400 Speed Ameroid/Altitude Compensator Test 1st version Setting Speed rpm : 500 Pressure hPa : -Rack travel mm : 9.40...9.70 Measurement 1/min : 500 Speed 1st pressure hPa : 250 Rack travel in m: 10.30...10.40 2nd pressure hPa : 550 Rack travel in m: 12.30...12.50 FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1000 rpm : 550 Del.quantity cm3/: 203.0...207.0 1000 s: (200.0...210.0) cm3 : 8.00Spread 1000 s: (12.0) Aneroid pressure h: -Speed rpm : 500
Del.quantity cm3/ : 130.0...132.0
1000 s: (127.0...135.0) cm3 : 8.00 Spread 1000 s: (12.0)

1st version 1mm rack travel less than

full load rack tr: 11.70 Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Remarks:

L11

BREAKAWAY

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : MB Edition : 26.02.93 Replaces : 11.92 Test oil : ISO-4113 Combination no. : 0 402 648 951 Injection pump Pump designation : PE8P120A320LS7840-1 EP type number : 0 412 628 862 Governor Governor design. : RQV350...1050PA1053 : 0 421 814 038 Governer no. Customer-spec. information Customer : MERCEDES-BENZ Engine : 0M442 A 1st version kW : 250.0 Rated speed : 2100 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 80...100 Test nozzle holder : 1 688 901 105 assembly Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 075 Outside diameter x Wall thickness : 8.00x2.50x1000 x Length mm

(A) Injection pump setting values

per values ____

Insp. values in parentheses Set equal delivery quant.

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00 : 8- 7- 2- 6- 3- 5-Firing order : 0-45-90-135-180-225-Phasing 270-315 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 8 BASIC SETTING 1st speed rpm : 700 Rack travel in mm : 13.30...13.40 Del.quantity cm3/: 20.9...21.1 100 s: (20.6...21.4) cm3 : 0.6Spread 100 s: (0.9) 2nd speed rpm : 350.0Rack travel in mm: 5.9...6.5 Del.quantity cm3/: 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.8 Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rom : 3501st speed travel mm : 1.00...1.50 2nd speed rpm : 453: 2.30...2.80 rpm : 770 travel mm 3rd speed : 4.70...5.20 travel mm 4th speed rpm : 1108 : 9.40...9.90 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1180 Speed Rack travel in mm : 10.40...13.00 FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700Aneroid pressure h: 1200

: 209.0...211.0 Del.quantity

1000 : (206.0...214.0)

: 6.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 102...110

Testing:

1st rack travel in: 11.60

rpm : 1090...1100 Speed

2nd rack travel in: 4.00

rpm : 1145...1175 Speed

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 70...78

Testing:

Speed rpm : 250 Minimum rack trave: 9.90 rpm

Rack travel in mm : 6.10...6.30

CONSTANT REGULATION

Speed rpm : 380...500

TORQUE CONTROL

Dimension a mm : 0.60

Torque control curve - 1st version

1st speed rpm : 700

Rack travel in m: 13.30...13.40

2nd speed

nd speed rpm : 1030 Rack travel in m: 12.70...12.90

3rd speed rpm : 825

Rack travel in m: 13.00...13.20

Aneroid/Altitude

Compensator Test

1st version

Setting

: 500 Speed rom hPa : -Pressure

: 11.00...11.30 Rack travel mm

Measurement

Speed $1/\min : 500$

1st pressure hPa : 350

Rack travel in m: 11.30...11.40

2nd pressure hPa : 700

Rack travel in m: 12.60...12.80

START CUT-OUT

1/min : 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

rpm : 1030 Speed

Del.quantity cm3/: 192.0...196.0 1000 s: (189.0...199.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1200

rpm : 1030 Speed

Del.quantity cm3/: 143.0...147.0 *

1000 s: (140.0...150.0)

Aneroid pressure h: -

Speed : 500 rpm

Del.quantity cm3/: 136.0...138.0

1000 s: (133.0...141.0)

cm3 : 8.00Spread

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.60

rpm : 1090...1100 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del. quantity cm3/: 200.0...220.0

1000 s: (196.0...224.0)

Remarks:

* = Set at reduced-delivery stop.

Note remarks

Test sheet

: MB

Edition

: 26.02.93

Replaces

: 11.92

Test oil

: ISO-4113

Combination no. : 0 402 648 952

Injection pump

Pump designation : PE8P120A320LS7856

EP type number

: 0 412 628 867

Governor

Governor design.

: RQV350...1050PA1051

Soverner no.

: 0 421 814 039

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M442 LA

1st version kW

: 320.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 60...80

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test Lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30 : (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 8-7-2-6-3-5-

Phasing

: 0-45-90-135-180-225-

270-315

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 8

BASIC SETTING

1st speed

Spread

Spread

rpm : 600

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 23.8...24.0

100 s: (23.5...24.3)

cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 4.3...4.9 Del.quantity cm3/: 1.6...2.2

100 s: (1.3...2.5)

cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed travel mm

rpm : 350 : 1.00...1.50

2nd speed

rpm : 453

travel mm

: 2.30...2.80

3rd speed

rpm : 770

travel mm

: 4.70...5.20

4th speed

rpm : 1108

travel mm

: 9.40...9.90

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1170

Rack travel in mm : 11.50...14.i0

FULL LOAD DELIV. AT FULL LOAD STOP

1st version Speed rpm : 600 Aneroid pressure h: 1000 Del.quantity Spread cm3RATED SPEED

: 238.0...240.0 1000 : (235.0...243.0)

: 6.00 1000 : (9.00)

1st version Control lever

position degrees: 102...110

Testing:

1st rack travel in: 11.90

rpm : 1080...1090 Speed

2nd rack travel in: 4.00

rpm : 1145...1175 Speed

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 68...76

Testing:

Speed : 250 rpm Minimum rack trave: 7.80 : 350 rom

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 350...450

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 13.20...13.30

rpm : 1050 2nd speed

Rack travel in m: 12.90...13.10

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rom hPa : Pressure

Rack travel mm : 9.70...10.00

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : 250

Rack travel in m: 10.00...10.10

2nd pressure hPa : 600

Rack travel in m: 11.70...11.90

START CUT-OUT

1/min : 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1050 Del.quantity cm3/ : 222.0...226.0

1000 s: (219.0...229.0)

Spread cm3 : 8.001000 s: (12.0)

Aneroid pressure h: 1000 rpm : 1050 Speed

Del.quantity cm3/ : 166.0...170.0 *

1000 s: (163.0...173.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 142.0...144.0 1000 s: (139.0...147.0)

cm3 : 8.00Spread 1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.90

rpm : 1080...1090Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 240.0...260.0

1000 s: (236.0...264.0)

Remarks:

* = Set at reduced-delivery stop.

Note remarks

Test sheet

: MB

Edition

: 05.02.93

Replaces

: 11.92

Test oil

: ISO-4113

Combination no.

: 0 402 676 814

Injection pump

Pump designation : PE6P120A320LS7861

EP type number

: 0 412 626 876

Governor

Governor design.

: RSV350...1050P0A535

Governer no.

: 0 421 833 386

Customer-spec. information

Customer

: MERCEDES-BENZ

Engine

: 0M 401 LA

1st version kW

: 213.0

Rated speed

: 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

Orifice plate

diameter mm

: 0,8

: 207...210

Test lines

: 1 680 750 075

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x1000

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order

: 6-3-5-2-4-1

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed

rpm : 1030

Rack travel in mm : 12.60...12.70

Del.quantity cm3/: 20.5...20.7

100 s: (20.2...21.0)

Spread

cm3 : 0.6

100 s: (0.9)

rpm : 350.0

Rack travel in mm: 4.8...5.4

Del.quantity cm3/: 1.0...1.6

100 s: (0.7...1.9)

Spread

2nd speed

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position Degree: -3

Speed

rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Del.quantity

Speed

Spread

rpm : 1030

Ameroid pressure h: 1200

: 205.0...207.0

1000 : (202.0...210.0)

cm3

: 6.00

1000 : (9.00)

RATED SPEED

1st version

L16

Control lever

position degrees: 95...103

Testing:

1st rack travel in: 11.40

rpm : 1070...1080 Speed

2nd rack travel in: 4.00

Speed rpm : 1145...1163 4th rack travel in: 1300

rpm : 0.30...1.40 Speed

LOW IDLE 1

Control lever

position degrees: 72...80

Setting point w/out bumper spring

rpm : 350 Rack travel in mm : 5.1

Testing:

Speed rpm : 100 Minimum rack trave: 19.50 Speed rpm : 350

Rack travel in mm : 4.80...5.40

Rack travel in mm : 2.00

rpm : 370...430 Speed

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 10.20...10.50

Measurement

1/min : 500 Speed

1st pressure hPa : 350

Rack travel in m: 11.20...11.30

2nd pressure hPa : 450

Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 800 Del.quantity cm3/ : 202.0...206.0

1000 s: (199.0...209.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed : 500 rpm

Del.quantity cm3/: 130.0...132.0

1000 s: (127.0...135.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/: 170.0...190.0

1000 s: (166.0...194.0)

Remarks:

Observe VDT-I-420/120

Note remarks

Test sheet : CUM 8,3 r 6 Edition : 26.02.93 Replaces : 05.92 Test oil : ISO-4113

Combination no. : 0 402 736 812

Injection pump

Pump designation : PES6P110A12ORS7214 EP type number : 0 412 716 805

Governor

Governor design. : RQV350...1200PA964

-4K

Governer no. : 0 421 815 256

Customer-spec. information Customer : CDC

Engine : 6CTA-A

1st version kW : 156.0 Rated speed : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

assembly : 1 688 901 101

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 4.35...4.45 Prestroke mm

: (4.30...4.50)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1200

Rack travel in mm : 12.30...12.40

Del.quantity cm3/: 14.7...14.9

100 s: (14.4...15.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 2.7...3.3

100 s: (2.5...3.5)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.80...2.00 travel mm

2nd speed : 450 rpm

: 3.10...3.50 travel mm

: 700 3rd speed rpm

5.90...6.30 travel mm

: 1200 4th speed rpm

: 9.00...9.20 travel mm

: 1400 5th speed rpm

: 10.70...11.10 travel mm

GUIDE SLEEVE POSITION

Control-lever position Degree: -1

rpm : 1260 Speed

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

Rack travel in m: 7.70...8.10 1st version 2nd pressure hPa : 225 Rack travel in m: 8.90...9.00 3rd pressure hPa : 575 rpm : 1200 Speed Aneroid pressure h: 1200 : 147.5...149.5 Del.quantity Rack travel in m: 11.20...11.60 1000 : (144.5...152.5) Spread : 5.00 cm3 START CUT-OUT 1000 : (9.00) Speed RATED SPEED 1st version Control lever position degrees: 60...68 1st version Testing: Speed 1st rack travel in: 11.30 rpm : 1245...1255 Speed 2nd rack travel in: 4.00 Speed rpm: 1365...1395 4th rack travel in: 1500 Aneroid pressure h: rpm : 0.00...1.00Speed LOW IDLE 1 Control lever position degrees: 11...19 **BREAKAWAY** Testing: Speed rpm : 275 1st version Minimum rack trave: 7.20 rpm : 350 Rack travel in mm : 5.40...5.60 Speed CONSTANT REGULATION rpm : 325...520 Speed STARTING FUEL DELIVERY TORQUE CONTROL Dimension a mm :? Speed rpm Torque control curve - 1st version 1st speed rpm : 1200 Rack travel in m: 12.30...12.40 2nd speed rpm : 650 Rack travel in m: 10.90...11.30 3rd speed rpm : 550 LOW IDLE Rack travel in m: 10.80...11.20 Speed Aneroid/Altitude Compensator Test Spread 1st version Settina Remarks: Speed : 1200 rpm Pressure hPa : 1200 Rack travel mm : 12.30...12.40 Measurement start of delivery $1/\min : 1200$ Speed 1st pressure hPa : -

L19

1/min : 290 (300) FUEL DELIVERY CHARACTERISTICS Aneroid pressure h: 1200 rpm : 650 Del.quantity cm3/: 151.0...157.0 1000 s: (148.0...160.0) Spread cm3: 8.00 1000 s: (12.0) rpm : 500 Del.quantity cm3/: 86.5...90.5 1000 s: (84.5...92.5) 1mm rack travel less than full load rack tr: 11.30 rpm : 1245...1255 : 100 Del.quantity cm3/: 135.0...175.0 1000 s: (130.0...180.0) Rack travel in mm : 10.70...11.70 rpm : 350 Rack travel in mm : 5.40...5.60 Del.quantity cm3/ : 27.0...33.0 1000 s: (25.0...35.0) cm3 : 8.00 1000 s: (12.00) : C.D.C. # 3921774 Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

Note remarks

Test sheet : CUM

: 26.02.93 Edition : 02.93 Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 823

Injection pump

Pump designation : PES6P110A120RS7249

EP type number : 0 412 716 807

Governor

Governor design. : RQV350...1150PA964

: 0 421 815 295 Governer no.

Customer-spec. information Customer : CDC

: 6CTA-A Engine

1st version kW : 187.0 Rated speed : 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 115...125

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45

: (4.30...4.50)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

: 0-60-120-180-240-300 Phasing

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 1150

Rack travel in mm : 14.30...14.40

Del.quantity cm3/: 17.8...18.0

100 s: (17.5...18.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0Rack travel in mm : 5.4...5.6

Del.quantity cm3/: 2.3...2.9

100 s: (2.1...3.1)

cm3 : 0.7Spread

100 s: (1.1)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.70...2.10 travel mm

rpm : 4502nd speed travel mm

: 3.10...3.50 : 700

3rd speed rpm

travel mm : 5.90...6.30

4th speed : 1200 rpm

9.00...9.20 travel mm

5th speed : 1400 rpm

: 10.70...11.10 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1150

Aneroid pressure h: 1200

Del.quantity : 170.0...183.0)

cm3 : 5.00 Spread

1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 61...69

Testina:

1st rack travel in: 13.30

rpm : 1200...1210 Speed

2nd rack travel in: 4.00

rpm : 1370...1400 Speed

4th rack travel in: 1500

rpm : 0.00...1.00Speed

LOW IDLE 1

Control lever

position degrees: 11...19

Testing:

speed rpm : 275 Minimum rack trave: 7.10 Sneed

rpm : 350

Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 350...500

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

rpm : 1150 1st speed

Rack travel in m: 14.30...14.40

2nd speed rpm : 650

Rack travel in m: 11.60...12.00

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed : 1150 rpm

hPa : 1200 Pressure

Rack travel mm : 14.30...14.40

Measurement

Speed 1/min: 1150

1st pressure hPa : -

Rack travel in m: 7.90...8.30

2nd pressure hPa : 320 Rack travel in m: 9.60...9.70

3rd pressure hPa : 860

Rack travel in m: 13.20...13.60

START CUT-OUT

Speed 1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 650 Del.quantity cm3/ : 165.5...171.5 1000 s: (162.5...174.5)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 92.5...96.5

1000 s: (90.5...98.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.30

Speed rpm : 1200...1210

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...175.0

1000 s: (130.0...180.0)

Rack travel in mm : 10.90...11.90

LOW IDLE

rpm : 350

Rack travel in mm : 5.40...5.60 Del.quantity cm3/: 23.5...29.5 1000 s: (21.5...31.5)

cm3 : 7.00Spread

1000 s: (11.00)

Remarks:

: C.D.C. # 3921970

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

Start-of-delivery mark = 5.5° after

start of delivery cyl. 1.

Note remarks

Test sheet : CUM

Edition : 01.03.93

Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 831

Injection pump

Pump designation : PES6P120A120RS7261

EP type number : 0 412 726 876

Governor

Governor design. : RQV350...1100PA924

-8K

Governer no. : 0 421 815 318

Customer-spec. information Customer : CUMMINS

Engine : 6CTAA

1st version kw : 176.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 047

Inlet press., bar: 1.50

Test nozzle holder

: 1 688 901 101 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter

x Wall thickness

: 6.00X2.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ___

BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 3.50...3.60 : (3.45...3.65)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 10.80...10.90

Del.quantity cm3/: 14.4...14.6

100 s: (14.1...14.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0Rack travel in mm: 4.7...4.9 Del.quantity cm3/ : 2.3...2.9

100 s: (2.1...3.1) cm3 : 0.7

Spread 100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 1.10...1.50 rpm : 550 travel mm

2nd speed : 3.40...4.00 travel mm

3rd speed rpm : 900

travel mm : 6.10...6.70

4th speed rpm : 1150

travel mm : 8.40...8.60

5th speed rpm : 1250

travel mm : 9.40...9.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1400 Speed

Rack travel in mm : 6.00...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 900

: 144.0...146.0 1**000** : (141.0...149.0) Del.quantity

: 5.00 cm3 Spread 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 109...117

Testina:

1st rack travel in: 9.80

Speed rpm: 1140...1150 2nd rack travel in: 4.00

rpm : 1240...1270 Speed

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 66...74

Testing:

Speed rpm : 250 Minimum rack trave: 6.30 rpm : 350

Rack travel in mm : 4.70...4.90

CONSTANT REGULATION

rpm : 350...450 Speed

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 10.80...10.90

2nd speed rpm : 700

Rack travel in m: 9.90...10.10

3rd speed rpm : 900

Rack travel in m: 10.20...10.50

4th speed rpm : 400

Rack travel in m: 9.00...9.30

Aneroid/Altitude Compensator Test

1st version

Settina

Speed man. : 1100 Pressure hPa : 900

: 10.80...10.90 Rack travel mm

Measurement

1/min : 1100 Speed

1st pressure hPa : -

Rack travel in m: 7.40...7.60

2nd pressure hPa : 560

Rack travel in m: 10.20...10.30 3rd pressure hPa : 320

Rack travel in m: 8.40...8.60

START CUT-OUT

Speed 1/min : 270 (290)

FUEL DELIVERY CHARACTERISTICS

1st version

Arieroid pressure h: 900 rpm : 700 Speed

Del.quantity cm3/: 151.0...157.0

1000 s: (148.0...160.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: rpm : 500 Speed

Del.quantity cm3/: 105.0...109.0 1000 s: (103.0...111.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80

rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 250.0...280.0

1000 s: (246.0...284.0)

LOW IDLE

Speed rpm : 350 Rack travel in mm : 4.70...4.90 Del.quantity cm3/: 23.0...29.0

1000 s: (21.0...31.0)

Spread cm3 : 7.00

1000 s: (11.00)

Remarks:

: C.D.C. # 3281841

Start-of-delivery mark is at 7° after

start of delivery.

Note remarks

Test sheet : CUM

Edition : 08.03.93

Replaces

Test oil : ISO-4113

Combination no. : 0 402 736 834

Injection pump

Pump designation : PES6P120A120RS7265

: 0 412 726 882 EP type number

Governor

Governor design. : RQV350...1100PA964

-12K

: D 421 815 323 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 186.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 086

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

: 1 688 901 103 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,7

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x3.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ___

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 3.95...4.05 Prestroke mm

: (3.90...4.10)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1100

Rack travel in mm : 13.80...13.90

Del.quantity cm3/: 20.7...20.9

100 s: (20.4...21.2)

Spread cm3 : 0.5

100 s: (0.9)

rpm : 350.02nd speed Rack travel in mm: 6.7...6.9

Del.quantity cm3/: 2.0...2.6

100 s: (1.8...2.8)

cm3 : 0.8 Spread 100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 350

: 2.10...2.40 travel mm

2nd speed rpm : 450

travel mm : 3.20...3.60 3rd speed : 900 rpm

travel mm

5.60...6.00 1200 4th speed

rpm

travel mm 8.10...8.30

5th speed : 1400 rpm

travel mm : 10.20...10.60

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1200

Del.quantity : 207.5...207.5. 1000 : (204.5...212.5)

Spread cm3 : 5.001000 : (9.00) RATED SPEED 1st version Control lever position degrees: 58...66 Testing: 1st rack travel in: 12.50 Speed rpm : 1250...1280 2nd rack travel in: 4.00 Speed rom : 1405...1415 4th rack travel in: 1500 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 13...21 Testing: Speed rpm : 275 Minimum rack trave: 8.00 rpm : 350 Rack travel in mm : 6.70...6.90 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1100 Rack travel in m: 13.80...13.90 nd speed rpm : 650
Rack travel in m: 11.90...12.30 2nd speed rpm : 1200 3rd speed Rack travel in m: 13.50...13.70 rpm : 750 4th speed Rack travel in m: 12.20...12.60 Aneroid/Altitude Compensator Test 1st version Setting : 1100 Speed rom hPa : 1200 Pressure : 13.80...13.90 Rack travel mm

Setting
Speed rpm: 1100
Pressure hPa: 1200
Rack travel mm: 13.80...13.90

Measurement
Speed 1/min: 1100

1st pressure hPa: Rack travel in m: 9.20...9.60
2nd pressure hPa: 230
Rack travel in m: 10.30...10.40

3rd pressure hPa : 545

Rack travel in m: 12.50...12.90 START CUT-OUT Speed 1/min : 290 (300) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 650 Speed Del.guantity cm3/: 158.5...164.5 1000 s: (155.5...167.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: 1200 Speed rpm : 750 Del.quantity cm3/ : 171.5...177.5 1000 s: (168.5...190.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/ : 59.5...63.5 1000 s: (57.5...65.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 12.50 rpm : 1250...1280 Speed STARTING FUEL DELIVERY : 100 rom Del.quantity cm3/: 180.0...220.0 1000 s: (175.0...225.0) Rack travel in mm : 12.00...13.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 6.70...6.90

Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

: C.D.C. # 3922471

Note remarks

Test sheet : CUM Edition : 26.02.93

Replaces : 12.92 Test oil : ISO-4113

Combination no. : 0 402 736 836

Injection pump

Pump designation : PES6P120A120RS7265

: 0 412 726 882 EP type number

Governor

Governor design. : RQV350...1000PA964

-14K

: 0 421 815 325 Governer no.

Customer-spec. information Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 205.0 Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: D 403 510 253

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 90...110

Test nozzle holder

: 1 688 901 103 assembly

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,7

Test lines : 1 680 750 015

Outside diameter x Wall thickness

: 6.00X3.00X600 x Length mm

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values ___

BEGINNING OF DELIVERY

Test pressure, bar: 22...24

: 3.95...4.05 Prestroke mm

: (3.90...4.10) Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm: 1000

Rack travel in mm : 14.50...14.60

Del.quantity cm3/: 23.8...24.0

100 s: (23.5...24.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm: 6.4...6.6 Del.guantity cm3/: 1.8...2.4

100 s: (1.6...2.6)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 350 1st speed

: 1.80...2.00 travel mm

2nd speed rpm : 450

: 3.10...3.50 travel mm

3rd speed rpm : 600

: 5.10...5.50 travel mm

rpm : 1000 4th speed

travel mm : 8.10...8.30

5th speed : 1200 rpm

: 9.60...10.00 travel mm

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 230.0...243.0)

Spread cm3: 5.00 1000 : (9.00)RATED SPEED 1st version Control lever position degrees: 62...70 Testing: 1st rack travel in: 13.30 rpm : 1140...1170 Speed 2nd rack travel in: 4.00 rpm : 1295...1305 Speed 4th rack travel in: 1400 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 12...20 Testing: Speed rpm : 275 Minimum rack trave: 8.10 rpm : 350 Rack travel in mm : 6.40...6.60 CONSTANT REGULATION rpm : 325...520 Speed TORQUE CONTROL Dimension a mm :? Torque control curve - 1st version 1st speed rpm : 1000 Rack travel in m: 14.50...14.60 2nd speed rpm : 650 Rack travel in m: 13.15...13.55 3rd speed rpm : 1100 Rack travel in m: 14.30...14.50 4th speed rpm : 750 Rack travel in m: 13.40...13.80 Aneroid/Altitude Compensator Test 1st version Setting : 1000 Speed npm . Pressure hPa : 1200 Rack travel mm : 14.50...14.60 Measurement 1/min: 1000 Speed 1st pressure hPa : -Rack travel in m: 10.20...10.60

Rack travel in m: 13.20...13.60 START CUT-OUT 1/min : 290 (300) Speed FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 rpm : 750 Del.quantity cm3/: 211.5...217.5 1000 s: (208.5...220.5) cm3 : 8.00 Spread 1000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/ : 90.5...94.5 1000 s: (88.5...96.5) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 13.30 Speed rpm : 1140...1170 STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/ : 180.0...220.0 1000 s: (175.0...225.0) Rack travel in mm : 12.00...13.00 LOW IDLE Speed rpm : 350Rack travel in mm : 6.40...6.60 Del.quantity cm3/: 18.0...24.0 1000 s: (16.0...26.0) Spread cm3 : 8.001000 s: (12.00) Remarks: : C.D.C. # 3922427 Start-of-delivery mark = 5.5° after start of delivery cyl. 1.

2nd pressure hPa : 310

3rd pressure hPa : 650

Rack travel in m: 11.40...11.50

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : UNI 9,5 i Edition : 18.12.92 Replaces : 06.92 Test oil : ISO-4113 Combination no. : 0 402 746 901 Injection pump Pump designation : PES6P12OA72ORS7224 EP type number : 0 412 726 840 Governor Governor design. : RQV275...1100PA975K Governer no. : 0 421 815 266 Customer-spec. information Customer : IVECO-UNIC Engine : 8460.41.406 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder assembly : 1 688 901 105 Opening pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test Lines : 1 680 750 089 Outside diameter x Wall thickness x Length mm : 8.00x2.50x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75)Time to cyl. no. : 1 BASIC SETTING 1st speed rpm: 1100 Rack travel in mm : 12.70...12.80 Del.quantity cm3/: 21.7...21.9 100 s: (21.4...22.2) Spread cm3 : 0.5100 s: (0.9) rpm : 275.02nd speed Rack travel in mm: 5.0...5.4 Del.quantity cm3/: 2.3...2.9 100 s: (2.0...3.2) cm3 : 0.8 Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1145 1st speed travel mm : 10.30...10.50 rpm : 275 2nd speed : 1.30...1.50 travel mm rpm : 450 3rd speed 3.40...4.00 travel mm rpm : 750 4th speed : 5.90...6.30 rpm : 1350 travel mm 5th speed : 13.00...14.00 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1140 Rack travel in mm : 15.20...17.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100 Aneroid pressure h: 1200 : 217.0...219.0 Del.quantity 1000 : (214.0...222.0)

Firing order

: 1-5-3-6-2-4

per values

Test pressure, bar: 25...27

Rack travel in mm : 9.00...12.00

: 5.10...5.20

: (5.05...5.25)

BEGINNING OF DELIVERY

Prestroke mm

: 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control lever position degrees: 115...123 Testing: 1st rack travel in: 11.70 Speed rpm : 1140...1150 2nd rack travel in: 4.00 rpm : 1220...1250 4th rack travel in: 1350 rpm : 0.00...1.00 Speed LOW IDLE 1 Control Lever position degrees: 65...73 Testing: Speed rpm : 100 Minimum rack trave: 6.70 rpm : 275 Rack travel in mm : 5.10...5.30 CONSTANT REGULATION Speed rpm : 270...400 TORQUE CONTROL Dimension a mm : ? Torque control curve - 1st version rpm : 1100 1st speed Rack travel in m: 12.70...12.80 2nd speed rpm : 900 Rack travel in m: 12.60...12.80 3rd speed rpm : 700 Rack travel in m: 12.00...12.20 4th speed rpm : 500 Rack travel in m: 11.50...11.70 5th speed rpm : 350 Rack travel in m: 11.00...11.40 Aneroid/Altitude Compensator Test 1st version Setting Speed COM : 900 Pressure hPa : 1200 : 12.70...12.80

Rack travel mm Measurement

Speed $1/\min : 900$ 1st pressure hPa : -Rack travel in m: 7.40...7.60 2nd pressure hPa : 750

Rack travel in m: 11.30...11.40 3rd pressure hPa : 410 Rack travel in m: 8.60...9.00 START CUT-OUT Speed 1/min: 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1200 Speed rpm : 900

Del.quantity cm3/: 227.0...233.0 1000 s: (224.0...236.0) Aneroid pressure h: 1200 : 500° Speed rpm Del.quantity cm3/: 240.0...246.0 1000 s: (237.0...249.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/: 119.0...121.0 1000 s: (116.0...124.0)

BREAKAWAY 1st version 1mm rack travel less than

full load rack tr: 11.70 rpm : 1140...1150 Speed

STARTING FUEL DELIVERY

Speed : 100 rpm Del.quantity cm3/: 125.0...155.0 1000 s: (121.0...159.0)

LOW IDLE

Speed rpm : 275 Rack travel in mm : 5.00...5.40 Del.quantity cm3/: 23.0...29.0 1000 s: (20.0...32.0) Spread cm3 : 8.001000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

MO2

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

Test sheet

: RVI

Edition

: 22,01.93

Replaces Test oil

: 04.92 : 150-4113

Combination no.

: 0 402 746 931

Injection pump

Pump designation : PES6P120A320RS7236

EP type number

: U 412 726 848

Governor

Governor design.

: RQV275...1000PA1001

Governer no.

: 0 421 813 989

Customer

Customer—spec. information : RVI

Engine

: MTDR 063540 N/3

1st version kW

: 283.0

Rated speed

: 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 417 413 D25

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 089

Outside diameter

x Wall thickness

x Length mm

: 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60

: (4.45...4.65)

Rack travel in mm : 18.00...21.00

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

BASIC SETTING

1st speed

Spread

Spread

rpm : 600

Rack travel in mm : 13.20...13.30

Del.quantity cm3/: 28.2...28.4

100 s: (27.9...28.7)

cm3 : 0.5

100 s: (0.9)

rpm : 300.02nd speed Rack travel in mm: 4.9...5.3

Del.quantity cm3/ : 2.8...3.2 100 s: (2.5...3.5)

cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1080

travel mm : 8.40...8.60 rpm : 275 : 1.20...1.40 2nd speed

travel mm

rpm : 490 3rd speed

: 3.50...4.10 travel mm

4th speed rpm : 775

: 5.90...6.30 travel mm

rpm : 1450 5th speed

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1190 Speed

Rack travel in mm : 11.90...14.50

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

MO3

Del.quantity : 282.0...284.0

1000 : (279.0...287.0)

Spread cm3 : 5.60 1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 297...305

Testing:

1st rack travel in: 12.20

rpm : 1065...1075 Speed

2rd rack travel in: 4.00

rpm : 1190...1220 Speed

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 243...251

Testing:

Speed : 200 rom Minimum rack trave: 6.50 : 300 rpm

Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed : 310...420 rom

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rom : 500 Pressure hPa : 1000

Rack travel mm : 13.20...13.30

Measurement

Speed $1/\min : 500$

1st pressure hPa : -

Rack travel in m: 8.90...9.50

2nd pressure hPa : 480

Rack travel in m: 12.10...12.20

3rd pressure hPa : 240

Rack travel in m: 10.10...10.50

START CUT-OUT

Speed 1/min: 195 (215)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

: 1000 Speed rpm

Del.quantity cm3/: 260.0...266.0 1000 s: (257.0...269.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 159.0...161.0

1000 s: (156.0...164.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 1065...1075

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 145.0...175.0 1000 s: (141.0...179.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.90...5.30

Del.quantity cm3/: 28.0...32.0 1000 s: (25.0...35.0) Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : RVI Edition : 26.02.93 Replaces Test oil : ISO-4113 Combination no. : 0 402 746 935 Injection pump Pump designation : PES6P120A320RS7267 EP type number : 0 412 726 883 Governor Governor design. : RQV275...1000PA1001 -3 : 0 421 814 025 Governer no. Customer—spec. information Customer : RVI Engine : MIDR 063540 J/31 : 314.0 1st version kW : 2000 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Openina : 207...210 pressure, bar Orifice plate diameter mm : 0,8 Test lines : 1 680 750 089 Outside diameter x Wall thickness

: 8.00x2.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____ BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60 : (4.45...4.65) Rack travel in mm : 10.50...11.50 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75)BASIC SETTING 1st speed rpm : 600 Rack travel in mm : 12.10...12.20 Del.quantity cm3/: 30.9...31.1 100 s: (30.6...31.4) Spread cm3 : 0.5100 s: (0.9) rpm : 275.0 2nd speed Rack travel in mm: 5.5...5.7 Del.quantity cm3/: 3.7...4.1 100 s: (3.4...4.4) cm3 : 0.8 Spread 100 s: (1.2) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 1080: 8.00...8.20 travel mm rpm : 275 2nd speed travel mm : 1.10...1.40 3rd speed rpm : 500: 3.50...4.10 travel mm 4th speed rpm : 800 travel mm : 5.80...6.20 5th speed rpm : 1400 travel mm : 11.00...12.00 GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1235 Rack travel in mm : 10.80...13.40 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 1000

Del.quantity : 309.0...311.0

1000 : (306.0...314.0)

: 5.00 Spread cm3 1000 : (9.00)

RATED SPEED

1st version Control lever

position degrees: 298...306

Testing:

1st rack travel in: 11.10

Speed rpm : 1065...1075

2nd rack travel in: 4.00

Speed rpm : 1180...1210

4th rack travel in: 1300

rpm : 0.00...1.00Speed

LOW IDLE 1 Control lever

position degrees: 246...254

Testing:

Speed : 200 rom Minimum rack trave: 7.00 Speed : 275 rom

Rack travel in mm : 5.60...5.80

CONSTANT REGULATION

Speed rpm : 260...380

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm hPa : 1000 Pressure

Rack travel mm : 12.10...12.20

Measurement

1/min : 500 Speed

1st pressure hPa : -

Rack travel in m: 8.60...9.00

2nd pressure hPa : 400

Rack travel in m: 11.40...11.50

3rd pressure hPa : 160

Rack travel in m: 9.30...9.60

START CUT-OUT

Speed 1/min : 225 (245)

FUEL DELIVERY CHARACTERISTICS

1st version

MO6

Aneroid pressure h: 1000

Speed : 1000 rpm

Del.quantity cm3/: 292.0...298.0 1000 s: (289.0...301.0)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 161.0...163.0

1000 s: (158.0...166.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.10

rpm : 1065...1075 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...170.0

1000 s: (136.0...174.0)

LOW IDLE

Speed rpm : 275
Rack travel in mm : 5.50...5.90
Del.quantity cm3/ : 37.0...41.0
1000 s: (34.0...44.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : UNT : 18.12.92 Edition : 11.92 Replaces Test cil : ISO-4113 Combination no. : 0 402 746 937 Injection pump Pump designation : PES6P120A720PS7268 EP type number : 0 412 726 884 Governor Governer no. : 0 421 801 671 Customer-spec. information Customer : IVECO-UNIC Engine : 8460,41,603 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Test nozzle holder : 1 688 901 105 assembly Openina . pressure, bar : 207...210 Orifice plate diameter mm : 0,8 Test lines : 1 680 750 015 Outside diameter x Wall thickness : 6.00x1.50x600 x Length mm (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values __

Governor design. : RQ275/1100PA915-2 BEGINNING OF DELIVERY Test pressure, bar: 25...27 : 5.10...5.20 : (5.05...5.25) Prestroke mm Rack travel in mm : 9.00...12.00 MO7

Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.30 (0.75) Time to cyl. no. : 1 BASIC SETTING 1st speed rom: 1100 Rack travel in mm : 11.50...11.60 Del.quantity cm3/ ; 18.3...18.5 100 s: (18.0...18.8) cm3 : 0.5Spread 100 s: (0.9) 2nd speed rpm : 275.0Rack travel in mm : 5.0...5.4 Del.quantity cm3/ : 2.0...2.6 100 s: (1.7...2.9) Spread cm3 : 0.8100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -2 rpm : 600 Speed Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 1100Aneroid pressure h: 900 Del.quantity : 183.0...188.0) cm3 : 5.00 1000 : (9.00) Spread RATED SPEED 1st version Setting point: Speed rpm Rack travel in mm : 20.0 Testing: 1st rack travel in: 10.50 Speed rpm : 1145...1160 2nd rack travel in: 4.00

rpm : 1230...1260

Speed

4th rack travel in: 1350

Speed rpm : 0.90...1.00

LOW IDLE 1

Setting point w/out bumper spring

rpm : 275 Rack travel in mm: 5.2

Testing:

Speed rpm : 100

Minimum rack trave: 6.70

rpm : 275

Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00

: 325...365 rpm

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1100
Rack travel in m: 12.00...12.10

2nd speed rpm : 550

Rack travel in m: 12.00...12.20

Aneroid/Altitude Compensator Test

1st version

Setting

rpm : 500 hPa : 900 Speed Pressure -

Rack travel mm : 11.50...11.60

Measurement

 $1/\min : 500$ Speed

1st pressure hPa : -

Rack travel in m: 8.60...8.80

2nd pressure hPa : 310
Rack travel in m: 10.80...10.90
3rd pressure hPa : 240

Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 550
Del.quantity cm3/: 197.0...203.0
1000 s: (194.0...206.0)

Aneroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 104.0...106.0

1000 s: (101.0...109.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.50

rpm : 1145...1160 Speed

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/ : 115.0...145.0

1000 s: (111.0...149.0)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Check electrically unlatched starting fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

Note remarks

Test sheet : UNI

Edition : 26.02.93 Replaces : 11.92

Test oil : ISO-4113

Combination no. : 0 402 746 938

Injection pump

Pump designation : PES6P120A720RS7269

EP type number : 0 412 726 885

Governor

Governor design. : RQ310/1025PA872-1

Governer no. : 0 421 801 672

Customer-spec. information

Customer : IVECO-UNIC

Engine : 8460.21.313

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 015

Outside diameter

x Wall thickness

x Length mm : 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20

: (5.05...5.25)

Rack travel in mm : 12.00...13.00

Firing order : 1-5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack tray. m: 5.40...5.60 & maximum rack tra: 12.0...13.0

Difference ° CS : 2.00...4.00

BASIC SETTING

rpm: 1025 1st speed

Rack travel in mm : 12.60...12.70

Del.quantity cm3/: 19.2...19.4

100 s: (18.9...19.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 310.0 Rack travel in mm : 5.7...6.1 Del.quantity cm3/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600 Speed

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1025

Aneroid pressure h: 900

Del.quantity : 192.0...194.0 1000 : (189.0...197.0)

: 5.00 Spread cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed

rpm : 600 Rack travel in mm : 20.0

MO9

Testing:

1st rack travel in: 11.60

rpm : 1070...1085

2nd rack travel in: 4.00

Speed rpm : 1180...1210 4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 310 Rack travel in mm: 5.8

Testina:

Speed rpm : 100 Minimum rack trave: 7.30

rpm : 310

Rack travel in mm : 5.70...5.90

Rack travel in mm: 2.00

rpm : 425...465 Speed

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 1025

Rack travel in m: 13.10...13.20

4th speed rpm : 650

Rack travel in m: 13.10...13.30

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 500 hPa : 900 Pressure

Rack travel mm : 12.60...12.70

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 9.60...9.80
2nd pressure hPa : 310
Rack travel in m: 11.90...12.00
3rd pressure hPa : 240

Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 550 Del.quantity cm3/ : 212.0...218.0 1000 s: (209.0...221.0)

Aneroid pressure h: -

Speed rpm : 500

M10

Del.quantity cm3/: 123.0...125.0

1000 s: (120.0...128.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1070...1085

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 105.0...135.0

1000 s: (101.0...139.0)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

Check electrically unlatched starting

fuel delivery (EES) with 24 volt.

On activation of the starting solenoid, the start position must be reached.

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : IHC Edition : 11.01.93 Replaces Test oil : ISO-4113 Combination no. : 0 402 746 940 Injection pump Pump designation : PES6P110A320LS7277 EP type number : 0 412 716 809 Governor Governor design. : RQV350...1000PA1054K : 0 421 815 337 Governer no. Customer-spec. information Customer : NAVISTAR Engine : DTA-531 1st version kW : 224.0 Rated speed : 2000 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 2 417 413 076 Inlet press., bar : 2.80 Overflow quantity min. 1/h: 170...190 Test nozzle holder assembly : 1 688 901 101 Opening. : 207...210 pressure, bar Orifice plate diameter mm : 0,6 Test Lines : 1 680 750 008 Outside diameter

x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____

BEGINNING OF DELIVERY Test pressure, bar: 22...24 : 2.85...2.95 Prestroke mm : (2.80...3.00) Rack travel in mm : 14.00...17.00 Firing order : 1-5-3-6-2-4 Phasing : 0-60-120-180-240-300 Tolerance $+ - \circ : 0.50 (0.75)$ Time to cyl. no. : 1 BASIC SETTING rpm: 650 1st speed Rack travel in mm : 14.80...14.90 Del.quantity cm3/: 23.4...23.6 100 s: (23.1...23.9) Spread cm3 : 0.8100 s: (1.2) rpm : 350.02nd speed Rack travel in mm: 5.1...5.3 Del.quantity cm3/: 1.2...1.6 100 s: (0.9...1.8) Spread cm3 : 0.4100 s: (0.6) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL 1st speed rpm : 350travel mm : 1.40...1.60 : 500 2nd speed rpm. : 3.50...3.90 travel mm 3rd speed : 800 rpm : 6.80...7.20 travel mm : 1000 4th speed rpm : 8.90...9.10 travel mm 5th speed : 1200 rpm travel mm : 11.50...11.90 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 650 Aneroid pressure h: 1500 : 234.5...236.5

1000 : (231.5...239.5)

Del.quantity

Spread

cm3 : 8.00

1000 : (12.00)

RATED SPEED

1st version

Control lever

position degrees: 62...70

Testina:

1st rack travel in: 14.10

rpm : 1040...1070 Speed

2nd rack travel in: 4.00

rpm : 1170...1180 Speed

4th rack travel in: 1250

rpm : 0.00...1.00Speed

LOW IDLE 1

Control leven

position degrees: 15...23

Testing:

Speed

rpm : 275

Minimum rack trave: 7.20

rpm : 350

Rack travel in mm : 5.10...5.30

CONSTANT REGULATION

Speed

rpm : 325...520

TORQUE CONTROL

Dimension a mm :?

Torque control curve - 1st version

1st speed rpm : 650

Rack travel in m: 14.80...14.90

2nd speed rpm : 1000

Rack travel in m: 15.10...15.30

3rd speed rpm : 500

Rack travel in m: 13.40...13.80

Aneroid/Altitude

Compensator Test

1st version

Settina

Speed : 1000 mqn

hPa : 1500 Pressure

Rack travel mm : 15.10...15.30

Measurement

Speed

1/min: 1000

1st pressure hPa : -

Rack travel in m: 9.10...9.40

2nd pressure hPa : 390

Rack travel in m: 10.80...10.90

3rd pressure hPa : 950

Rack travel in m: 13.60...14.00

START CUT-OUT

Speed

1/min : 290 (300)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500

: 1000 rpm

Del.quantity cm3/: 211.5...217.5 1000 s: (208.5...220.5)

cm3 : 8.00

Spread

1000 s: (12.0)

Aneroid pressure h: rpm_ : 1000 Speed

Del.quantity cm3/: 83.5...87.5

1000 s: (31.5...89.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.10

rpm : 1040...1070 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 140.0...180.0

1000 s: (135.0...185.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.10...5.30

Del.guantity cm3/: 12.0...16.0

1000 s: (9.5...18.5)

cm3 : 4.00Spread

1000 s: (6.50)

Remarks:

: NAVISTAR #1815915c91

Setting and blocking of pointer of

start-of-delivery sensor on cyl. 1

start of delivery

Delivery-valve spring pre-tension =

6.00...6.10 mm.

Permissible alteration from 5.70...6.30

Note remarks

Test sheet

: UNI

Edition

: 05.02.93

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 746 942

Injection pump

Pump designation : PES6P120A72CRS7224-1

EP type number

: 0 412 726 889

Governor

Governor design. : RQ275/1050PA1021-2

Governer no.

: 0 421 801 676

Customer

Customer-spec. information : IVECO-UNIC

Engine

: 8460,41,721

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test Lines

: 1 680 750 015

Outside diameter

x Wall thickness

x Lenath mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.10...5.20 : (5.05...5.25)

Rack travel in mm : 9.00...12.00

M13

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed

rpm: 1050

Rack travel in mm: 10.80...10.90

Del.quantity cm3/: 18.8...19.0

100 s: (18.5...19.3)

Spread

cm3 : 0.5

100 s: (0.9)

rpm : 275.02nd speed

Rack travel in mm: 4.8...5.2 Del.quantity cm3/: 2.0...2.6

100 s: (1.7...2.9)

Spread

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1050

Aneroid pressure h: 900

Del.quantity : 188.0...190.0

1000 : (185.0...193.0)

Spread

: 5.00

cm3

1000 : (9.00)

RATED SPEED

1st version

Setting point: Speed

rpm

: 600

Rack travel in mm: 20.0

Testing:

Speed

1st rack travel in: 9.80

Speed

rpm : 1095...1110

2nd rack travel in: 4.00

rpm : 1170...1200

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 275 Rack travel in mm: 5.0

Testing:

Speed rpm : 100 Minimum rack trave: 6.50 rpm : 275

Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00

: 335...375 וחכורו

TORQUE CONTROL

Dimension a mm :-

Torque control curve - 1st version

rpm : 1050 1st speed

Rack travel in m: 11.30...11.40

2nd speed rpm : 550

Rack travel in m: 11.30...11.50

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 850 Pressure hPa : 900

Rack travel mm : 10.80...10.90

Measurement

1/min: 850 Speed

1st pressure hPa : -

Rack travel in m: 7.30...7.50

2nd pressure hPa : 430

Rack travel in m: 9.90...10.00

3rd pressure hPa : 250

Rack travel in m: 8.20...8.40

START CUT-OUT

1/min: 215 (235) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900

Speed rpm : 550
Del.quantity cm3/: 218.0...224.0
1000 s: (215.0...227.0)

Aneroid pressure h: -Speed rpm : 500

Del.quantity cm3/: 126.0...128.0

1000 s: (123.0...131.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.80

Speed rpm : 1095...1110

STARTING FUEL DELIVERY

rpm : 100 Speed

Del.quantity cm3/: 130.0...160.0 1000 s: (126.0...164.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.80...5.20 Del.quantity cm3/: 20.0...26.0

1000 s: (17.0...29.0)

cm3 : 8.00 Spread 1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

APPLICATION

Omnibus

Note remarks

Test sheet

: UNI

Edition

: 01.03.93

Replaces

Test oil

: ISO-4113

Combination no. : 0 402 746 943

Injection pump

Pump designation : PESSP12UA72URS7224-1

EP type number

: 0 412 726 889

Governor

Governor design. : RQ275/1050PA1021-3

Governer no.

: 0 421 801 677

Customer-spec. information Customer

: IVECO-UNIC

Engine

: 8460.41.731

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 1 688 901 105

Opening |

pressure, bar

: 207...210

Orifice plate

diameter mm

: 0,8

Test lines

: 1 680 750 015

Outside diameter

x Wall thickness

x Length mm

: 6.00x1.50x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 5.10...5.20

: (5.05...5.25)

Rack travel in mm : 9.00...12.00

M15

Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed

Spread

Spread

rpm: 1050

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 22.2...22.4

100 s: (21.9...22.7)

cm3 : 0.5

100 s: (0.9)

rpm : 275.0 2nd speed

Rack travel in mm: 4.8...5.2 Del.quantity cm3/: 2.0...2.6

100 s: (1.7...2.9)

cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

rpm : 600

Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 222.0...227.0)

1000 : (9.00)

RATED SPEED

1st version

Testing:

Speed

Setting point:

rpm

: 600

Rack travel in mm: 20.0

1st rack travel in: 11.70

rpm : 1095...1110 Speed

2nd rack travel in: 4.00

rpm : 1190...1220

4th rack travel in: 1350

rpm : 0.00...1.00 Speed

LOW IDLE 1

Setting point w/out bumper spring

rpm : 275 Rack travel in mm: 5.0

Testing:

Speed rpm : 100 Minimum rack trave: 6.50

Speed rpm: 275 Rack travel in mm: 4.90...5.10

Rack travel in mm: 2.00

: 335...375 Speed rpm

TORQUE CONTROL

Dimension a mm

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 13.20...13.30

rpm : 550 2nd speed

Rack travel in m: 13.20...13.40

Aneroid/Altitude Compensator Test

1st version

Setting

Speed mar: : 850 Pressure hPa : 1200

Rack travel mm : 12.70...12.80

Measurement

Speed 1/min: 850

1st pressure hPa : -

Rack travel in m: 7.50...7.70

2nd pressure hPa : 580

Rack travel in m: 11.30...11.40

3rd pressure hPa : 290

Rack travel in m: 8.60...9.00

START CUT-OUT

Speed 1/min: 215 (235)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 : 550 rpm

Del.quantity cm3/: 266.0...274.0

1000 s: (263.0...277.0)

Ameroid pressure h: -

rpm : 500 Speed

Del.quantity cm3/: 126.0...128.0 1000 s: (123.0...131.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 1095...1110 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 130.0...160.0

1000 s: (126.0...164.0)

LOW IDLE

Speed rpm : 275

Rack travel in mm : 4.80...5.20

Del.quantity cm3/ : 20.0...26.0 1000 s: (17.0...29.0)

cm3 : 8.00Spread

1000 s: (12.00)

Remarks:

Setting and blocking of pointer of start-of-delivery sensor on cyl. 1

start of delivery

APPLICATION

Omnibus

M16

Note remarks

Test sheet : RVI

Edition : 11.01.93

Replaces

: ISO-4113

Combination no. : 0 402 746 944

Injection pump

Pump designation : PES6P120A320RS7267

EP type number : 0 412

: 0 412 726 883

Governor

Test oil

Governor design. : RQV275...1000PA1001

Governer no. : 0

: 0 421 814 045

Customer-spec. information

Customer : RVI

Engine : MIDR 063540 N/31

1st version kW : 283.0

Rated speed : 2000

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Test nozzle holder

assembly : 1 688 901 105

Openina

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test Lines : 1 680 750 089

Outside diameter x Wall thickness

x Length mm : 8.00x2.50x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant. per values

pc. values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60

: (4.45...4.65)

Rack travel in mm : 10.50...11.50 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.50 (0.75)$

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 28.2...28.3

100 s: (27.9...28.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0 Rack travel in mm : 5.7...6.1 Del.quantity cm3/ : 3.1...3.5 100 s: (2.8...3.8)

cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

Spread

1st speed rpm : 1080

travel mm : 8.00...8.20

2nd speed rpm : 275

travel mm : 1.10...1.30

3rd speed rpm : 500

travel mm : 3.50...4.10

4th speed rpm : 800

travel mm : 5.80...6.20

5th speed rpm : 1400

travel mm : 11.00...12.00

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

Speed rpm : 1235

Rack travel in mm : 9.70...13.70

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 600 Aneroid pressure h: 1000

M17

Del.quantity : 282.0...283.0 1000 : (279.0...286.0) : 5.00 Spread cm3 1000 : (9.00) RATED SPEED 1st version Control Lever position degrees: 296...304 Testina: 1st rack travel in: 10.70 rpm : 1065...1075 Speed 2nd rack travel in: 4.00 Speed nom : 1180...1210 4th rack travel in: 1300 Speed rpm : 0.00...1.00LOW IDLE 1 Control lever position degrees: 244...252 Testing: Speed : 200 rpm Minimum rack trave: 7.00 : 300 rpm Rack travel in mm: 5.80...6.00 CONSTANT REGULATION Speed rpm : 260...380 Aneroid/Altitude Compensator Test 1st version Setting Speed : 500 ripm hPa : 1000 Pressure : 11.70...11.80 Rack travel mm Measurement Speed $1/\min : 500$ 1st pressure hPa : -Rack travel in m: 8.80...9.20 2nd pressure hPa : 320 Rack travel in m: 10.90...11.00 3rd pressure hPa : 160 Rack travel in m: 9.50...9.80 START CUT-OUT

1/min: 240 (260)

FUEL DELIVERY CHARACTERISTICS

Aneroid pressure h: 1000 : 1000 Speed rpm Del.quantity cm3/: 264.0...270.0 1000 s: (261.0...273.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 158.0...160.0 1000 s: (155.0...163.0) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 10.70 rpm : 1065...1075 Speed STARTING FUEL DELIVERY Speed rpm Del.quantity cm3/: 140.0...170.0 1000 s: (136.0...174.0) LOW IDLE Speed rpm : 300 Rack travel in nm : -5.60...-6.00 Del.quantity cm3/: 31.0...35.0 1000 s: (28.0...38.0) cm3 : 8.00 Spread 1000 s: (12.00) Remarks: Setting and blocking of pointer of start-of-delivery sensor on cyl. 1 start of delivery

1st version

M18

Speed

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet

: VOL 7,1 h : 18.12.92 Edition : 12.91 Replaces Test oil : ISO-4113

Combination no. : 0 402 846 052

Injection pump

Pump designation : PE6P110A320RS8009-1 EP type number : 0 412 816 011

Governor

Governor design. : RQV300...1100PA1017

Governer no. : 0 421 813 965

Customer-spec. information Customer

Engine : TD73kBE

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 078

Inlet press., bar: 2.50

Test nozzle holder

assembly : 1 688 901 101

Openina

: 207...210 pressure, bar

Orifice plate

diameter mm : 0.6

Test Lines : 1 680 750 008

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.80...3.90 : (3.75...3.95)

Rack travel in mm : 9.00...12.00

Firing order : 1-5- 3- 6- 2- 4

Phasina : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.30 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.00...10.10

Del.quantity cm3/: 16.4...16.6

100 s: (16.2...16.8)

cm3 : 0.5Spread

100 s: (0.9)

2nd speed rpm : 300.0Rack travel in mm: 4.2...4.6 Del.quantity cm3/: 2.1...2.5

100 s: (1.8...2.8)

cm3 : 0.7 Spread 100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 300 travel mm : 0.90...1.30

2nd speed rpm : 500

: 2.60...3.20 travel mm 3rd speed rpm : 800

travel mm : 4.90...5.50

rpm : 1150 4th speed

: 8.20...8.40 travel mm 5th speed rpm : 1300

travel mm : 10.10...10.50

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed

rpm : 1160 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700 Aneroid pressure h: 1200

Del.quantity : 164.0...166.0 1000 : (162.0...168.0)

Spread

cm3

: 5.00

1000 : (9.00)

RATED SPEED

1st version

Control lever

position degrees: 102...110

Testing:

1st rack travel in: 9.00

Speed rpm : 1140...1150 2nd rack travel in: 4.00

Speed rpm : 1200...1230 4th rack travel in: 1320

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 70...78

Testing:

Speed rom : 100

Minimum rack trave: 5.90 rpm : 300

Rack travel in mm : 4.20...4.40

CONSTANT REGULATION

Speed rpm : 300...370

Aneroid/Altitude Compensator Test

1st version

Setting

Speed rpm : 1000Pressure hPa : 1200

Rack travel mm : 10.00...10.10

Measurement

Speed 1/min: 1000

1st pressure hPa : -

Rack travel in m: 7.60...7.80

2nd pressure hPa : 90

Rack travel in m: 7.80...7.90

3rd pressure hPa : 375

Rack travel in m: 9.40...9.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 116.0...118.0

1000 s: (113.0...121.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.00

Speed rpm : 1140...1150

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.20...4.40

Remarks:

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks

: PEN Test sheet : 18.12.92 Edition : 10.92 Replaces Test oil : ISO-4113

Combination no. : 0 402 846 054

Injection pump

Pump designation : PE6P120A320RS8017 EP type number : 0 412 826 018

Governor

Governor design. : RQV300...1100PA1017

: 0 421 814 023 Governer no.

Customer-spec. information Customer : PENTA

: TWD 1030 ME Engine

1st version kW : 212.0 Rated speed : 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 2 417 413 078

Inlet press., bar: 2.50

Test nozzle holder

: 1 688 901 103 assembly

Opening

: 207...210 pressure, bar

Orifice plate

diameter mm : 0,7

: 1 680 750 008 Test lines

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 4.10...4.20 Prestroke mm

: (4.05...4.25)

Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4

Phasing : 0-60-120-180-240-300

Tolerance $+ - ^{\circ} : 0.30 (0.75)$

Time to cyl. no. : 1

BASIC SETTING

rpm: 700 1st speed

Rack travel in mm : 9.50...9.60

Del.quantity cm3/: 21.0...21.2

100 s: (20.7...21.5)

Spread cm3 : 0.6

100 s: (1.0)

rpm : 300.02nd speed Rack travel in mm: 4.5...4.9 Del.quantity cm3/: 1.7...2.3

100 s: (1.5...2.5)

cm3 : 0.7Spread 100 s: (1.1)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

rpm : 300 1st speed

: 0.90...1.30 travel mm

2nd speed rpm : 500

travel mm : 2.60...3.20 3rd speed rpm : 800

travel mm : 4.90...5.50

4th speed rpm : 1150

travel mm : 8.20...8.40

5th speed rpm : 1300

: 10.10...10.50 travel mm

GUIDE SLEEVE POSITION Control-lever position

Degree: -1 Speed

rpm : 1200 Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

M21

Aneroid pressure h: 1200

: 210.0...212.0 Del.quantity

1000 : (207.0...215.0)

: 6.00 Spread cm3

1000 : (10.00)

RATED SPEED

1st version Control lever

position degrees: 110...118

Testing:

1st rack travel in: 8.50

Speed rpm : 1120...1130

2nd rack travel in: 4.00

Speed rpm : 1175...1205

4th rack travel in: 1320

Speed rpm : 0.00...1.00

LCW IDLE 1

Control lever

position degrees: 76...84

Testing:

Speed rpm : 100 Minimum rack trave: 6.10 rpm : 300 Speed

Rack travel in mm : 4.50...4.70

CONSTANT REGULATION

Speed rpm : 300...360

Aneroid/Altitude Compensator Test

1st version

Setting

Speed : 500 rpm Pressure hPa : 1200

Rack travel mm : 9.50...9.60

Measurement

Speed 1/min: 500

1st pressure hPa : -

Rack travel in m: 6.90...7.10

2nd pressure hPa : 260 Rack travel in m: 7.10...7.20

3rd pressure hPa : 560

Rack travel in m: 8.80...9.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 Speed rpm : 1100 Del.quantity cm3/: 182.0...188.0

1000 s: (179.0...191.0)

cm3 : 10.00Spread

1000 s: (14.0)

Aneroid pressure h: -

Speed rpm : 700 Del.quantity cm3/ : 130.5...132.5

1000 s: (127.5...135.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 8.50

rpm : 1120...1130 Speed

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.50...4.70

:

Remarks:

M22

BOSCH INJ. PUMP TEST SPECIFICATIONS : 3.80...3.90 Prestroke mm : (3.75...3.95) Rack travel in mm : 9.00...12.00 Note remarks : 1-5- 3- 6- 2- 4 Firing order Test sheet : VOL Edition : 18.12.92 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 0 402 846 055 Tolerance + - ° : 0.30 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PE6P110A32ORS8009-1 EP type number : 0 412 816 011 BASIC SETTING Governor Governor design. : RQV300...1200PA1043 1st speed rpm: 700 Governer no. : 0 421 814 024 Rack travel in mm : 11.80...11.90 Customer-spec. information Customer : VME Del.quantity cm3/: 19.7...19.9 Engine : TD73KCE 100 s: (19.5...20.1) 1st version kW : 186.0 cm3 : 0.5Spread : 2400 Rated speed 100 s: (0.9) TEST BENCH REQUIREMENTS 2nd speed rpm : 300.0Test oil Rack travel in mm: 4.3...4.7 inlet temp. °C : 38...42 Del.quantity cm3/ : 2.2...2.6 100 s: (1.9...2.9) Overflow valve Spread cm3 : 0.7: 2 417 413 078 100 s: (1.1) Inlet press., bar: 2.50 (B) Setting of injection pump with governor Test nozzle holder : 1 688 901 101 assembly GUIDE SLEEVE TRAVEL 1st speed rpm : 300 Opening : 0.90...1.30 travel mm : 207...210 pressure, bar rpm : 500 2nd speed : 2.60...3.20 travel mm Orifice plate 3rd speed rpm : 800 diameter mm : 0,6 : 4.60...5.30 travel mm rpm : 1250 4th speed travel mm : 8.10...8.30 Test lines : 1 680 750 008 rpm : 1400 5th speed travel mm : 9.60...10.00 Outside diameter x Wall thickness GUIDE SLEEVE POSITION x Length mm : 6.00X2.00X600 Control-lever position Degree: -1 (A) Injection pump setting values Speed rpm : 1260 Insp. values in parentheses Rack travel in mm : 15.20...17.80 Set equal delivery quant. per values FULL LOAD DELIV. AT FULL LOAD STOP BEGINNING OF DELIVERY 1st version

Speed

rpm : 700

Aneroid pressure h: 1300

Test pressure, bar: 25...27

Del.quantity : 197.0...199.0 1000 : (195.0...201.0) cm3 : 5.00 1000 : (9.00) Spread

RATED SPEED

1st version Control lever

position degrees: 112...120

Testing:

1st rack travel in: 10.80

rpm : 1240...1250 Speed

2nd rack travel in: 4.00

Speed rpm : 1330...1360 4th rack travel in: 1450

rpm : 0.00...1.00 Speed

LOW IDLE 1 Control lever

position degrees: 77...85

Testing:

rpm : 200 Speed Minimum rack trave: 6.50 Speed rpm : 300 Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

rpm : 300...370 Speed

Aneroid/Altitude Compensator Test

1st version Setting

: 500 Speed man Pressure hPa : 1300

: 11.80...11.90 Rack travel mm

Measurement

1/min: 500 Speed

1st pressure hPa : -

Rack travel in m: 7.40...7.60

2nd pressure hPa : 240

Rack travel in m: 7.60...7.70

3rd pressure hPa : 920

Rack travel in m: 11.20...11.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 10.80

Speed rpm : 1240...1250

LOW IDLE

rpm : 300Speed

Rack travel in mm : 4.30...4.50

Remarks:

Speed rpm : 700 Del.quantity cm3/ : 113.0...115.0 1000 s: (110.0...118.0)

BOSCH INJ. PUMP TEST SPECIFICATIONS Rack travel in mm : 21.00...0.00 Firing order : 1 - 5 - 3 - 6 - 2 - 4Note remarks Test sheet : MB 6,1 f Edition : 11.03.93 Phasing : 0-60-120-180-240-300 Replaces : 22.01.92 Test oil : ISO-4113 Tolerance + - ° : 0.50 (0.75)Combination no. : 0 403 246 030 BASIC SETTING Injection pump 1st speed rpm : 1300Pump designation : PES6MW100/720RS1511 : 0 413 206 011 EP type number Rack travel in mm: 13.40...13.50 Governor Governor design. : RQ300/1300MW105-9 Del.quantity cm3/: 13.0...13.2 Governer no. : 0 420 082 061 100 s: (12.8...13.6) Customer-spec, information Customer : MERCEDES-BENZ Spread cm3 : 0.3: 0M366LA Enaine 100 s: (0.6) : 177.0 rpm : 300.01st version kW 2nd speed Rated speed : 2600 Rack travel in mm: 4.2...4.4 : 2600 Rated speed Del.quantity cm3/: 1.0...1.4 100 s: (0.7...1.6) TEST BENCH REQUIREMENTS Spread cm3 : 0.3100 s: (0.5) Test oil inlet temp. °C : 38...42 GUIDE SLEEVE POSITION Control-lever position Overflow valve Degree: -2 : 1 419 992 198 Speed rpm : 1000 Rack travel in mn: 14.70...16.30 Inlet press., bar: 1.50 FULL LOAD DELIV. AT FULL LOAD STOP Test nozzle holder assembly : 0 681 343 009 1st version Speed rpm : 1300 Openina Aneroid pressure h: 1200 pressure, bar : 172...175 Del.quantity : 130.0...132.0 1000 : (128.0...136.0) : 3.50 Spread cm3 Test lines : 1 680 750 089 1000 : (6.00) Outside diameter RATED SPEED x Wall thickness x Length mm : 8.00x2.50x600 1st version (A) Injection pump setting values Setting point: Insp. values in parentheses Speed rom Set equal delivery quant. Rack travel in mm: 15.5 per values ____ Testing: 1st rack travel in: 12.40 Speed rpm : 1345...1360 BEGINNING OF DELIVERY Test pressure, bar: 30...32 2nd rack travel in: 4.00 : 5.20...5.30 : (5.15...5.35) Prestroke mm rpm : 1445...1475

4th rack travel in: 1550

Speed rpm : 0.00...1.00LOW IDLE 1 Setting point w/out bumper spring

Speed rpm : 300 Rack travel in mm: 4.3

Testing:

Speed rpm : 200Minimum rack trave: 6.00 Speed rpm: 300

Rack travel in mm : 4.20...4.40

Aneroid/Altitude Compensator Test

1st version Setting

Speed : 500 rioni Pressure hPa : -

Rack travel mm : 7.80...7.90

Measurement

1/min : 500 Speed

1st pressure hPa : 300

Rack travel in m: 8.50...8.70

2nd pressure hPa : 600

Rack travel in m: 10.60...10.80

3rd pressure hPa : 1200

Rack travel in m: 13.40...13.50

START CUT-OUT

Speed 1/min : 180 (200)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200 rpm : 750 Speed

Del.quantity cm3/: 122.5...125.5 1000 s: (120.0...128.0)

cm3 : 5.00

Spread 1000 s: (7.00)

Aneroid pressure h: -

Speed rpm : 500 Del.quantity cm3/ : 46.0...48.0

1000 s: (44.0...50.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 12.40

Speed rpm : 1345...1360 STARTING FUEL DELIVERY

Speed rpm : 100
Del.quantity cm3/ : 115.0...125.0

1000 s: (112.0...128.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.20...4.40 Del.quantity cm3/: 10.0...14.0

1000 s: (7.5...16.5) cm3 : 3.50 1000 s: (5.50) Spread

Remarks:

M26

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.80...2.90 : (2.75...2.95) Rack travel in mm : 9.00...12.00 Firing order : 1-5-3-6-2-4 Note remarks Test sheet : CUM Edition : 21.01.93 Replaces Test oil : ISO-4113 Phasing Combination no. : 9 400 083 449AC Tolerance + - ° Injection pump Time to cyl. no. : 1 Pump designation : PES6A1DOD320/3RS2691 EP type number : 9 410 230 025 Governor Governor design. : RSV400...1100A2C2209 & maximum rack tra: 21.00 Governer no. : 9 420 083 201 Cust, part no. : 3352893-VERSA002 BASIC SETTING Customer-spec. information 1st speed rpm: 1100 Customer : CUMMINS Engine : 6 CT 8.3 L 1st version kW : 134.0 : 2200 Rated speed TEST BENCH REQUIREMENTS cm3 : 0.3Spread Test oil 100 s: (0.6) inlet temp. °C : 38...42 2nd speed rpm : 400.0Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 cm3 : 0.3Spread 100 s: (0.5) Test nozzle holder : 0 681 343 009 assembly GUIDE SLEEVE POSITION Control-lever position Opening. Degree: -3 pressure, bar : 172...175 rpm : 800 Speed Test lines : 1 680 750 014 Click setting \times : 2.50 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 1st version (A) Injection pump setting values Speed rpm : 1100Insp. values in parentheses Del.quantity 1000 Set equal delivery quant. per values : 3.50 Spread cm3

: 0-60-120-180-240-300 : 0.50 (0.75)BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 9.00...12.00 Difference ° CS : 3.00...4.00 Rack travel in mm : 10.20...10.30 Del.quantity cm3/: 8.7...8.9 100 s: (8.5...9.1) Rack travel in mm: 4.9...5.1 Del.quantity cm3/: 0.9...1.3 100 s: (0.7...1.6) Rack travel in mm : 0.30...1.00 Governor spring pre-tension FULL LOAD DELIV. AT FULL LOAD STOP : 87.5...89.5 : (85.5...91.5) 1000 : (6.00)RATED SPEED

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

1st version Control lever

position degrees: 85...93

Testing:

1st rack travel in: 9.20

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1170 ...1200 Speed

4th rack travel in: 1350

Speed rpm : 0.30...1.70

LOW IDLE 1 Control lever

position degrees: 62...70

Setting point w/out bumper spring

rpm : 400 Rack travel in mm: 4.5

Testing:

beea rpm : 100 Minimum rack trave: 19.00

rpm : 400 Speed

Rack travel in mm : 4.90...5.10

Rack travel in mm : 2.00

Speed rpm : 540...600

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 10.20...10.30

2nd speed rpm : 500 Rack travel in m: 12.10...12.30

rpm : 750 3rd speed

Rack travel in m: 12.10...12.30

4th speed rpm : 950

Rack travel in m: 11.30...11.50

FUEL DELIVERY CHARACTERISTICS

1st version

: 500 Speed rpm

Del.quantity cm3/: 101.0...104.0

1000 s: (98.5...106.5)

Speed rpm : 750

Del.quantity cm3/: 115.0...118.0

1000 s: (112.5...120.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.20

rpm : 9140...1150 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...149.0

1000 s: (132.0...152.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400 Rack travel in mm : 4.90...5.10 Del.quantity cm3/: 9.5...13.5 1000 s: (7.0...16.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle after start of delivery cyl. 1

M28

Note remarks

Test sheet

: CUM

Edition

: 21.01.93

Replaces

Test oil

: ISO-4113

Combination no.

: 9 400 083 449CA

Injection pump

Pump designation: PES6A100D320/3RS2691

EP type number

: 9 410 230 025

Governor

Governor design.

: RSV400...1100A2C2209

Governer no.

: 9 420 083 201

Cust, part no.

: 3915294-VERSA02D

Customer

Customer-spec. information : CUMMINS

Engine

: 6 CTA 8.3 L

1st version kW

: 164.0

Rated speed

: 2200

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Openina .

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.80...2.90

: (2.75...2.95)

Rack travel in mm : 9.00...12.00 Firing order

: 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed

rpm: 1100

Rack travel in mm : 11.50...11.60

Del.quantity cm3/: 11.0...11.2

100 s: (10.8...11.4)

Spread

2nd speed

cm3 : 0.3

100 s: (0.6)

rpm : 400.0

Rack travel in mm: 5.9...6.1

Del.quantity cm3/: 1.9...2.3

100 s: (1.6...2.5)

Spread cm3 : 0.3

100 s: (0.5)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

FULL LOAD DELIV. AT FULL LOAD STOP

Governor spring pre-tension

Click setting x : 2.50

1st version

Speed

Spread

rpm : 1100

Del.quantity

: 110.0...112.0

1000 : (108.0...114.0)

: 3.50 cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 85...93

Testing:

1st rack travel in: 10.50

rpm : 1140...1150 Speed

2nd rack travel in: 4.00

rpm : 1180...1210 Speed

4th rack travel in: 1350

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 62...70

Setting point w/out bumper spring

rpm : 400

Rack travel in mm : 5.5

Testing:

Speed rpm : 100

Minimum rack trave: 19.00

Speed rpm: 400

Rack travel in mm : 5.90...6.10 Rack travel in mm : 2.00

rpm : 585...645 Speed

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1100

Rack travel in m: 11.50...11.60

2nd speed rpm : 500
Rack travel in m: 12.20...12.40
3rd speed rpm : 750

Rack travel in m: 12.20...12.40

4th speed rpm : 950

Rack travel in m: 11.80...12.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500 Del.quantity cm3/ : 102.5...105.5

1000 s: (100.0...108.0)

rpm : 750 Speed

Del.quantity cm3/: 119.0...122.0

1000 s: (116.5...124.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack to: 10.50

Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100 Del.quantity cm3/ : 135.0...149.0

1000 s: (132.0...152.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 400

Rack travel in mm : 5.90...6.10 Del.quantity cm3/: 19.0...23.0 1000 s: (16.5...25.5) Spread cm3: 3.50

1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle

after start of delivery cyl. 1

BOSCH INJ. PUMP TEST SPECIFICATIONS Prestroke mm : 2.80...2.90 : (2.75...2.95) Note remarks Rack travel in mm : 9.00...12.00 : 1-5- 3- 6- 2- 4 Firing order Test sheet : CUM Edition : 21.01.93 Replaces Test oil : ISO-4113 Phasing : 0-60-120-180-240-300 Combination no. : 9 400 083 450AJ Tolerance + - ° : 0.50 (0.75) Injection pump Time to cyl. no. : 1 Pump designation : PES6A100D320/3RS2691 EP type number : 9 410 230 025 BEGINNING OF DELIVERY DIFFERENCE Governor Governor design. : RSV375...1150A2C2210 betw. rack trav. m: 9.00...12.00 & maximum rack tra: 21.00 : 9 420 083 202 Difference ° CS : 3.00...4.00 Governer no. Cust. part no. : 3353250-VERSA009 BASIC SETTING Customer-spec, information 1st speed rpm : 1250Customer : CUMMINS Rack travel in mm : 10.70...10.80 Engine : 6 C 8.3 L Del.quantity cm3/ : 9.2...9.4 1st version kW : 120.0 : 2300 Rated speed 100 s: (9.0...9.6) TEST BENCH REQUIREMENTS Spread cm3 : 0.3Test oil 100 s: (0.6) inlet temp. °C : 38...42 2nd speed rpm : 375.0 Overflow valve Rack travel in mm: 5.1...5.3 : 1 419 992 198 Del.quantity cm3/: 0.9...1.3 100 s: (0.6...1.5) Inlet press., bar: 1.50 cm3 : 0.3Spread 100 s: (0.5) Test nozzle holder assembly : 0 681 343 009 GUIDE SLEEVE POSITION Control-lever position Opening. Degree: -3 : 172...175 pressure, bar rpm : 800 Rack travel in mm : 0.30...1.00 Test lines : 1 680 750 014 Governor spring pre-tension Click setting x : 3.50Outside diameter x Wall thickness FULL LOAD DELIV. AT FULL LOAD STOP x Length mm : 6.00x2.00x600 1st version (A) Injection pump setting values Speed rpm : 1250 Insp. values in parentheses Del.quantity : 92.0...94.0 Set equal delivery quant. 1000 : (90.0...96.0) per values : 3.50 Spread cm3 1000 : (6.00) BEGINNING OF DELIVERY

RATED SPEED

Test pressure, bar: 25...27

1st version Control lever

position degrees: 94...102

Testina:

1st rack travel in: 9.70

Speed rpm : 1290...1300

2nd rack travel in: 4.00

Speed rpm : 1335...1365 4th rack travel in: 1500

Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever

position degrees: 65...73

Setting point w/out bumper spring

Speed rpm : 375 Rack travel in mm: 4.7

Testina:

rpm : 100 Speed

Minimum rack trave: 19.00

rpm : 375

Rack travel in mm : 5.10...5.30 Rack travel in mm : 2.00

Speed rom : 535...595

TORQUE CONTROL

Torque control curve - 1st version

1st speed rom : 1250 Rack travel in m: 10.70...10.80

2nd speed

nd speed rpm : 500 Rack travel in m: 11.80...12.00

3rd speed rpm : 600

Rack travel in m: 11.80...12.00

4th speed rpm : 900

Rack travel in m: 11.30...11.50

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600

Del.quantity cm3/: 100.5...103.5

1000 s: (98.5...105.5)

: 900 Speed rpm

Del.quantity cm3/: 99.5...102.5 1000 s: (97.0...105.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70

rpm : 1290...1300 Speed

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 135.0...149.0

1000 s: (132.0...152.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 375

Rack travel in mm : 5.10...5.30 Del.quantity cm3/: 9.0...13.0

1000 s: (6.5...15.5)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle

after start of delivery cyl. 1

APPLICATION

Installation 2300

NO4

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet : CUM Edition : 21.01.93 Replaces Test oil : ISO-4113 Combination no. : 9 400 083 452DH Injection pump Pump designation : PES6A100D320/3RS2691 EP type number : 9 410 230 028 Governor Governor design: : RQV350...1250AB1225R Governer no. : 9 420 080 224 Cust. part no. : 3355244-VERSA037 Customer-spec. information Customer : CUMMINS Engine : 6 CT 8.3 L 1st version kW : 157.0 Rated speed : 2500 TEST BENCH REQUIREMENTS Test oil inlet temp. °C : 38...42 Overflow valve : 1 419 992 198 Inlet press., bar: 1.50 Test nozzle holder : 0 681 343 009 assembly **Opening** pressure, bar : 172...175 Test lines : 1 680 750 014 Outside diameter x Wall thickness x Length mm : 6.00x2.00x600 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

: 2.80...2.90 Prestroke mm : (2.75...2.95) Rack travel in mm : 9.00...12.00 : 1-5- 3- 6- 2- 4 Firing order Phasing : 0-60-120-180-240-300 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 1BEGINNING OF DELIVERY DIFFERENCE betw. rack trav. m: 9.00...12.00 & maximum rack tra: 21.00 Difference ° CS : 3.00...4.00 BASIC SETTING rpm: 1150 1st speed Rack travel in mm : 11.50...11.60 Del.quantity cm3/: 10.8...11.0 100 s: (10.6...11.2) cm3 : 0.3Spread 100 s: (0.6) rpm : 350.02nd speed Rack travel in mm: 5.2...5.4 Del.quantity cm3/: 1.2...1.6 100 s: (1.0...1.9) cm3 : 0.3Spread 100 s: (0.5) (B) Setting of injection pump with governor GUIDE SLEEVE TRAVEL rpm : 1265 1st speed : 8.40...8.60 travel mm rpm : 900 2nd speed : 5.50...6.00 travel mm 500 3rd speed rpm 3.70...4.20 travel mm : 350 4th speed rpm : 1.80...2.30 travel mm GUIDE SLEEVE POSITION Control-lever position Degree: -1 rpm : 1250 Speed Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

1st version

rpm : 1150 Sceed

Del.quantity : 108.0...(10.0)

1000 : (106.0...112.0)

: 3.50 Spread cm3

1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 110...118

Testing:

1st rack travel in: 10.50

rpm : 1190...1200 Speed

2nd rack travel in: 4.00

Speed rpm : 1310...1340 4th rack travel in: 1500

rpm : 0.00...1.00 Speed

LOW IDLE 1

Control lever

position degrees: 67...75

Setting point w/out bumper spring

rpm : 350 Rack travel in mm: 5.3

Testing:

Speed rpm : 100 Minimum rack trave: 9.80

Speed rpm : 350 Rack travel in mm : 5.20...5.40

CONSTANT REGULATION

rpm : 350...500 Speed

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1150

Rack travel in m: 11.50...11.60

2nd speed rpm : 500

Rack travel in m: 12.10...12.20 3rd speed rpm : 750

Rack travel in m: 12.10...12.20

: 900 4th speed rom

Rack travel in m: 11.70...11.90

START CUT-OUT

1/min : 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500 Del.quantity cm3/ : 105.0...108.0

1000 s: (102.5...110.5)

N06

Speed rpm : 750

Del.quantity cm3/: 115.0...118.0

1000 s: (112.5...120.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50

Speed rpm : 1190...1200

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 156.0...186.0 1000 s: (151.0...191.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 350

Rack travel in mm : 5.20...5.40

Del.quantity cm3/: 12.5...16.5 1000 s: (10.0...19.0)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

Start-of-delivery mark 11° cam angle

after start of delivery cyl. 1

Note remarks

Test sheet Edition

: CUM $5.9 \times$: 11.01.93

Replaces

: 09.92

Test oil

: ISO-4113

Combination no. : 9 400 083 459

Injection pump

Pump designation : PES6A95D12ORS2822

EP type number

: 9 400 084 029

Governor

Governor design.

: RQV350...1250AB1235-

2R

Governer no.

: 9 420 080 311

Customer

Customer-spec. information : CUMMINS

Engine

: 6 BT

1st version kW

: 119.3

Rated speed

: 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening.

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

× Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.75...2*.*85

: (2.70...2.90)

Rack travel in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 2.00...3.00

BASIC SETTING

1st speed

rpm : 1250

Rack travel in mm : 12.70...12.80

Del.quantity cm3/: 8.6...8.8

100 s: (8.4...9.0)

Spread

cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm: 5.0...5.2 Del.quantity cm3/: 0.6...1.0

100 s: (0.4...1.2)

Spread

cm3 : 0.3100 s: (0.5)

(B) Setting of injection pump

with governor

GUIDE SLEEVE TRAVEL

1st speed

rpm : 1300

travel mm : 6.80...6.90

2nd speed travel mm

rpm : 350

: 1.20...1.70

3rd speed travel mm

rpm : 700

: 4.00...4.50

4th speed rpm : 1550

travel mm

: 8.30...8.80

GUIDE SLEEVE POSITION Control-lever position

Degree: -1

rpm : 1530

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1250 Speed Aneroid pressure h: 600

: \$6.0...83.0 Deliquantity 1000 : (84.0...90.0)

cm3 : 3.50

Spread 1000 : (6.00)

RATED SPEED

1st version Control lever

position degrees: 107...115

Testing:

1st rack travel in: 11.70

rpm : 1310...1320 Speed

2nd rack travel in: 4.00

Speed rpm : 1545...1575 4th rack travel in: 1750 Speed rpm : 0.00...1.00

LOW IDLE 1 Control lever

position degrees: 63...71

Testing:

Speed rpm : 100 Minimum rack trave: 7.00 rpm : 350

Rack travel in mm: 5.00...5.20

CONSTANT REGULATION

rpm : 475...575 Speed

Aneroid/Altitude Compensator Test

1st version

Setting

: 500 Speed rpm: hPa : 600 Pressure

: 12.70...12.80 Rack travel mm

Measurement

 $1/\min: 500$ Speed

1st pressure hPa : -

Rack travel in m: 11.60...11.90

2nd pressure hPa : 320 Rack travel in m: 11.70...11.80

3rd pressure hPa : 410

Rack travel in m: 12.30...12.50

START CUT-OUT

1/min: 270 (290) Speed

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 600 : 700 Speed rom

Del.quantity cm3/: 80.0...83.0

1000 s: (77.5...85.5)

Aneroid pressure h: -

Speed rpm: 500 Del.quantity cm3/: 64.0...67.0

1000 s: (62.0...69.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

rpm : 1310...1320 tesaZ

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 115.0...135.0

1000 s: (110.0...140.0)

Rack travel in mm : 19.00...21.00

LOW IDLE

rpm : 350 Speed

Rack travel in mm : 5.00...5.20 Del.quantity cm3/: 6.0...10.0

1000 s: (4.0...12.0)

cm3 : 3.50Spread

1000 s: (5.50)

Remarks:

: C.D.C # 3355264

Start-of-delivery mark 9.5° cam angle

after start of delivery cyl. 1

Note remarks

Test sheet

: MWM

Edition

: 05.03.93

Replaces

Test oil

: ISO-4113

Combination no.

: 9 400 085 241

Injection pump

Pump designation : PES3A90D320RS2703

EP type number

: 9 400 083 096

Governor

Governor design.

: RSV350...1150A2C2129

-4R

Governer no.

: 9 420 083 268

Customer

Customer-spec, information

Engine

: D 229-3

: MwM

1st version kW

: 42.7

Rated speed

: 2300

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Openina

pressure, bar

: 172...175

Test lines

: 1 680 750 003

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses

Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.65...2.75

: (2.60...2.80)

Rack travel in mm : 9.00...12.00

: 1- 2- 3 Firina order

Phasing

: 0-120-240

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00 Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed

rom : 1150

Rack travel in mm : 8.50...8.60

Del.quantity cm3/ : 5.8...5.9

100 s: (5.6...6.1)

Spread

cm3 : 0.3

100 s: (0.5)

rpm : 350.0 2nd speed

Rack travel in mm: 5.5...5.7

Del.quantity cm3/: 1.1...1.5

100 s: (0.9...1.7)

cm3 : 0.2Spread

100 s: (0.4)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -3 Speed

rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.25

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

Spread

rpm : 1150

Del.quantity

: 58.0...59.0

1000 : (56.0...61.0)

cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

NO9

Control lever position degrees: 93...101 Testing: 1st rack travel in: 7.50 rpm : 1190...1200 Speed 2nd rack travel in: 4.00 Speed rpm : 1220...1250 4th rack travel in: 1400 Speed rpm : 0.30...1.70 LOW IDLE 1 Control lever position degrees: 68...76 Setting point w/out bumper spring rpm : 350 Rack travel in mm: 5.1 Testing: Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 350
Rack travel in mm : 5.50...5.70
Rack travel in mm : 2.00 rpm : 550...610 TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1150 Rack travel in m: 8.50...8.60 2nd speed rpm : 500 Rack travel in m: 9.40...9.50 4th speed rpm : 800 Rack travel in m: 8.90...9.10 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/: 54.0...56.0 1000 s: (51.5...58.5) Speed rpm: 800 Del.quantity cm3/: 60.5...62.5 1000 s: (58.0...65.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 7.50 rpm : 1190...1200 Speed

STARTING FUEL DELIVERY rpm : 100 Rack travel in mm : 19.00...21.00

Remarks: : VALMET **APPLICATION** Tractor (tractor engines)

N10

Note remarks

Test sheet

: MWM

Edition

: 05.03.93

Replaces

Test oil

: ISO-4113

Combination no. : 9 400 085 272

Injection pump

Pump designation : PES4A90D320RS2744

EP type number

: 9 400 084 012

Governor

Governor design. : RSV350...1300A2c2215

-2R

Governer no.

: 9 420 083 275

Customer

Customer-spec. information

: MWM

Engine

: TD 229-4

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00X2.00X600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values ____

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.70...2.80

: (2.65...2.85)

Rack travel in mm : 9.00...12.00

Firing order

: 1-3-4-2

Phasing

: 0-90-180-270

Tolerance + - * : 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed

rpm : 1300

Rack travel in mm : 10.60...10.70

Del.guantity cm3/: 8.9...9.0

100 s: (8.7...9.2)

Spread

cm3 : 0.3

100 s: (0.5)

2nd speed rpm : 350.0 Rack travel in mm: 4.9...5.1

Del.quantity cm3/: 1.1...1.5

100 s: (0.9...1.7)

Spread

cm3 : 0.2100 s: (0.4)

GUIDE SLEEVE POSITION

Control-Lever position

Speed

Degree: -3 rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.75

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed Del.quantity rpm : 1300

: 89.0...90.0

1000 : (87.0...92.0)

Spread

cm3 : 3.00

1000 : (5.00)

RATED SPEED

1st version

Control lever

position degrees: 105...113

Testing:

N11

1st rack travel in: 9.60 rpm : 1340...1350 Speed 2nd rack travel in: 4.00 rpm : 1410,..1440 Speed 4th rack travel in: 1600 Speed rpm : 0.30...1.70LOW IDLE 1 Control lever position degrees: 74...82 Setting point w/cut bumper spring rpm : 350 Rack travel in mm: 4.5 Testing: rpm : 100 Speed Minimum rack trave: 19.00 rpm : 350 Rack travel in mm : 4.90...5.10 Rack travel in mm : 2.00 rpm : 540...600 Speed TORQUE CONTROL Torque control curve - 1st version 1st speed rpm : 1300 Rack travel in m: 10.60...10.70 2nd speed rpm : 500 Rack travel in m: 11.20...11.30 3rd speed rpm : 800 Rack travel in m: 10.90...11.20 4th speed rpm : 900 Rack travel in m: 10.80...10.90 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/: 87.0...89.0 1000 s: (84.5...91.5) rpm : 900 Speed Del.quantity cm3/: 89.0...91.0 1000 s: (86.5...93.5) **BREAKAWAY** 1st version 1mm rack travel less than full load rack tr: 9.60 Speed rpm : 1340...1350STARTING FUEL DELIVERY

rpm : 100Rack travel in mm : 19.00...21.00 Speed rpm : 350 Rack travel in mm : 4.90...5.10 Del.quantity cm3/: 11.0...15.0 1000 s: (9.0...17.0) Spread cin3 : 2.50 1000 s: (4.50)

Remarks:

N12

Speed

LOW IDLE

Note remarks

Test sheet

: MAM

Edition

: 05.03.93

Replaces

Test oil

: ISO-4113

Combination no. : 9 400 085 332

Injection pump

Pump designation : PES6A90D320RS2727

EP type number

: 9 400 084 007

Governor

Governor design. : RSV350...1200A2C2097

Governer no.

: 9 420 083 279

Customer

Customer-spec. information : MWM

Engine

: D 229 EC 6

1st version kW

Rated speed

: 90.8 : 2400

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C

: 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

assembly

: 0 681 343 009

Opening

pressure, bar

: 172...175

Test lines

: 1 680 750 014

Outside diameter

x Wall thickness

x Length mm

: 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm

: 2.70...2.80

: (2.65...2.85)

N13

Rack travet in mm : 9.00...12.00

Firing order : 1-5-3-6-2-4

Phasing

: 0-60-120-180-240-300

Tolerance + - °

: 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 3.00...4.00

BASIC SETTING

1st speed

rpm: 1200

Rack travel in mm: 9.10...9.20

Del.quantity cm3/ : 5.9...6.0

100 s: (5.7...6.2)

100 s: (0.5)

cm3 : 0.3

2nd speed rpm : 350.0 Rack travel in mm : 5.4...5.6 Del.quantity cm3/: 0.8...1.2

100 s: (0.6...1.4)

Spread

Spread

cm3 : 0.2

100 s: (0.4)

GUIDE SLEEVE POSITION Control-lever position

Degree: -3

Speed rpm: 800 Rack travel in mm: 0.30...1.00

Governor spring pre-tension

Click setting x : 3.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed

rpm : 1200

Del.quantity 1000

: 59.5...60.5 : (57.5...62.5)

Spread

: 3.00 cm3

1000 : (5.00)

RATED SPEED

1st version

Control lever position degrees: 90...98 Testing: 1st rack travel in: 8.10 irpm : 1240...1250 Speed 2nd rack travel in: 4.00 rom : 1265...1295 Speed 4th rack travel in: 1450 rpm : 0.30...1.70Speed LOW IDLE 1 Control lever position degrees: 64...72 Setting point w/out bumper spring rom Rack travel in mm: 5.0 Testing: Speed rpm : 100 Minimum rack trave: 19.00 Speed rpm : 350 Rack travel in mm : 5.40...5.60 Rack travel in mm : 2.00 Speed rpm : 530...590 TORQUE CONTROL Torque control curve - 1st version rpm : 1200 1st speed Rack travel in m: 9.10...9.20 rpm : 500 2nd speed Rack travel in m: 10.10...10.20 rpm : 800 3rd speed Rack travel in m: 9.70...9.90 4th speed rpm : 1000 Rack travel in m: 9.30...9.60 FUEL DELIVERY CHARACTERISTICS 1st version Speed rpm : 500 Del.quantity cm3/ : 55.5...57.5 1000 s: (53.0...60.0) rpm : 800 Speed Del.quantity cm3/: 62.0...64.0 1000 s: (59.5,..66.5) BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 8.10

Speed rpm : 1240...1250

STARTING FUEL DELIVERY

Speed rpm : 100 Rack travel in mm : 19.00...21.00

LOW IDLE

1000 s: (4.50)

Remarks:

APPLICATION

Tractor (tractor engines)

Note remarks

Test sheet : MM Edition : 26,02,93 Replaces : 08.92 Test oil : ISO-4113

Combination no. : 9 400 085 349

Injection pump

Pump designation : PES6A95D410RS2812 EP type number : 9 400 084 028

Governor

Governor design. : RQV350...1250AB1260

-1L

: 9 420 080 330 Governer no.

Customer-spec. information Customer : MwM

: 6.10 T Engine

1st version kW : 129.5 Rated speed : 2500

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 419 992 198

Inlet press., bar: 1.50

Test nozzle holder

: 0 681 343 009 assembly

Opening.

pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter x Wall thickness

x Length mm : 6.00x2.00x600

(A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

: 2.75...2.85 Prestroke mm

: (2.70...2.90)

Rack travel in mm : 9.00...12.00

Firing order : 1 - 5 - 3 - 6 - 2 - 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° ; 0.50 (0.75)

Time to cyl. no. : 1

BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 9.00...12.00

& maximum rack tra: 21.00

Difference ° CS : 1.50...2.50

BASIC SETTING

1st speed rpm: 1250

Rack travel in mm : 11.70...11.80

Del.quantity cm3/: 9.1...9.3

100 s: (8.9...9.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.1...5.3 Del.quantity cm3/: 0.7...1.1

100 s: (0.6...1.3)

cm3 : 0.3Spread 100 s: (0.5)

(B) Setting of injection pump with governor

GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

: 7.10...7.30 travel mm

2nd speed rpm : 300

: 0.80...1.30 travel mm

3rd speed rpm : 550

: 2.50...3.00 travel mm

4th speed : 800 rpm travel mm : 3.70...4.20

5th speed : 1500 rpm

travel mm : 8.30...8.80

GUIDE SLEEVE POSITION

Control-lever position

Speed

Degree: -1 rpm : 1490

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version 1st pressure hPa : -Rack travel in m: 11.10...11.30 2nd pressure hPa : 380 Rack travel in m: 11.30...11.40 rpm : 1250 Speed Aneroid pressure h: 800 : 91.5...93.5 Del.quantity 1000 : (89.5...95.5) 3rd pressure hPa : 480 : 3.50 Spread cm3 Rack travel in m: 11.70...11.90 1000 : (6.00) START CUT-OUT RATED SPEED Speed 1/min: 270 (290) 1st version Control lever FUEL DELIVERY CHARACTERISTICS position degrees: 106...114 Testing: 1st version 1st rack travel in: 10.70 Aneroid pressure h: 800 rpm : 1300...1310 Speed rpm : 750 Speed Del.quantity cm3/: 91.0...94.0 2nd rack travel in: 4.00 rpm : 1455...1485 Speed 1000 s: (89.0...96.0) 4th rack travel in: 1630 Aneroid pressure h: 800 Speed rpm : 0.00...1.00 Speed rpm : 900 Del.quantity cm3/: 94.5...97.5 1000 s: (92.5...99.5) LOW IDLE 1 Control lever Aneroid pressure h: position degrees: 64...72 rpm : 500 Speed Del.quantity cm3/: 72.0...74.0 1000 s: (70.0...76.0) Testing: Speed rpm : 100 Minimum rack trave: 7.00 rpm : 350 BREAKAWAY Rack travel in mm : 5.10...5.30 1st version CONSTANT REGULATION 1mm rack travel less than rpm : 325...475 Speed full load rack tr: 10.70 TORQUE CONTROL Speed rpm : 1300...1310 Dimension a mm : 0.40 Torque control curve - 1st version STARTING FUEL DELIVERY rpm : 1250 1st speed Rack travel in m: 11.70...11.80 2nd speed rpm : 750 Speed rpm : 100 Rack travel in m: 12.10...12.20 Rack travel in mm: 19.00...21.00 3rd speed rpm : 900 Rack travel in m: 12.10...12.20 4th speed rpm : 1050 Rack travel in m: 11.90...12.00 LOW IDLE Speed rpm : 350 Rack travel in mm : 5.10...5.30 Aneroid/Altitude Del.quantity cm3/: 7.5...11.5 Compensator Test 1000 s: (6.0...13.0) Spread cm3 : 3.501000 s: (5.50) 1st version Setting Remarks: Speed : 500 rpm hPa : 800 Pressure Rack travel mm : 12.10...12.20 **APPLICATION** Measurement **Omnibus** 1/min : 500 Speed

N16

BOSCH INJ. PUMP TEST SPECIFICATIONS Note remarks Test sheet Edition : 11.01.93 Replaces Test oil : ISO-4113 Combination no. : 9 400 087 387 Injection pump Pump designation : PES5P120A720LS7174 -10 EP type number : 0 412 725 815 Governor Governer no. : 0 421 801 450 Customer-spec. information Customer : MERCEDES-BENZ : 0M449 A Engine 1st version kW : 184.0 : 2100 Rated speed TEST BENCH REQUIREMENTS Test oil inlet temp. "C : 38...42 Overflow valve : 1 417 413 025 Inlet press., bar: 1.50 Overflow quantity min. 1/h: 100...120 Test nozzle holder : 1 688 901 019 assembly Opening : 207...210 pressure, bar Orifice plate

Governor design. : RQ300/1050PA774-2 diameter mm : 0,8 Test lines : 1 680 750 067 Outside diameter x Wall thickness x Length mm : 6.00x1.50x1000 (A) Injection pump setting values Insp. values in parentheses Set equal delivery quant. per values ____ N17

BEGINNING OF DELIVERY Test pressure, bar: 25...27 Prestroke mm : 5.20...5.30 : (5.15...5.35) Rack travel in mm : 20.00...21.00 : 1- 3- 5- 4- 2 Firing order Phasing : 0-72-144-216-288 Tolerance + - ° : 0.50 (0.75) Time to cyl. no. : 5 BASIC SETTING 1st speed rpm : 600 Rack travel in mm : 14.10...14.30 Del.quantity cm3/: 19.6...19.8 100 s: (19.3...20.1) Spread cm3 : 0.5100 s: (0.9) 2nd speed rpm : 300.0Rack travel in mm : 6.4...7.0 Del.quantity cm3/ : 1.6...2.2 100 s: (1.3...2.5) cm3 : 0.8Spread 100 s: (1.2) GUIDE SLEEVE POSITION Control-lever position Degree: -2 Speed rom : 600 Rack travel in mm : 19.20...20.80 FULL LOAD DELIV. AT FULL LOAD STOP 1st version Speed rpm : 600 Aneroid pressure h: 650 Del.quantity : 196.0...198.0 1000 : (193.0...201.0) : 5.00 Spread cm3 1000 : (9.00)RATED SPEED 1st version Setting point:

: 600

rpm

Speed

Rack travel in mm : 20.0 Testing: 1st rack travel in: 13.40 beed rpm : 1095...1110 2nd rack travel in: 4.00 rpm : 1160...1190 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring rpm : 300 Rack travel in mm: 6.7 Test ina: Speed rpm : 200 Minimum rack trave: 8.70 rpm : 300 Rack travel in mm : 6.40...7.00 Rack travel in mm: 2.00 rpm : 370...410 Speed TORQUE CONTROL Dimension a mm : 0.40 Torque control curve - 1st version rpm : 1050 ist speed Rack travel in m: 14.40...14.60 2nd speed rpm : 750 Rack travel in m: 14.90...15.10 Aneroid/Altitude Compensator Test 1st version Setting Speed : 600 rom Pressure hPa : 650 Rack travel mm : 14.10...14.30 Measurement 1/min: 600 Speed 1st pressure hPa : 250 Rack travel in m: 12.20...12.40 2nd pressure hPa : 400 Rack travel in m: 13.50...13.70 3rd pressure hPa : 750 Rack travel in m: 14.20...14.30 4th pressure hPa : 850 Rack travel in m: 14.60...14.80 5th pressure hPa : -Rack travel in m: 11.90...12.20 START CUT-OUT 1/min : 220 (240) Speed FUEL DELIVERY CHARACTERISTICS

N18

1st version Aneroid pressure h: 1200 rpm : 1050 Specd Del.quantity cm3/: 208.0...211.0 1000 s: (205.0...214.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1200 rpm : 750 Speed Del.quantity cm3/: 216.0...220.0 1000 s: (213.0...223.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: rpm : 500 Speed Del.quantity cm3/: 150.0...152.0 1000 s: (147.0...155.0) Spread cm3: 8.00 1000 s: (12.0)

BREAKAWAY

1st version 1mm rack travel less than

full load rack tr: 13.40

Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/: 220.0...240.0 1000 s: (216.0...244.0)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

Note remarks

Test sheet : MB

Edition : 11.01.93

Replaces : -

Test oil : ISO-4113

Combination no. : 9 400 087 390

Injection pump

Pump designation : PES6P120A720LS7114

-13

EP type number : 0 412 726 867

Governor

Governor design. : RQ300/1050PA911

Governer no. : 0 421 801 476

Customer-spec. information

Customer : MERCEDES-BENZ

Engine : 0M447 LA

1st version kw : 257.0 Rated speed : 2100

TEST BENCH REQUIREMENTS

Test oil

inlet temp. °C : 38...42

Overflow valve

: 1 417 413 025

Inlet press., bar: 1.50

Overflow

quantity min. 1/h: 100...120

Test nozzle holder

assembly : 1 688 901 019

Opening

pressure, bar : 207...210

Orifice plate

diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter × Wall thickness

 \times Length mm : 6.00x1.50x1000

(A) Injection pump setting values

Insp. values in parentheses Set equal delivery quant.

per values

BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30

: (5.15...5.35)

Rack travel in mm : 9.00...12.00

Firing order : 6-2-4-1-5-3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

BASIC SETTING

1st speed rpm: 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/: 22.9...23.1

100 s: (22.6...23.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.8...6.2 Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.8

100 s: (1.2)

GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600 Rack travel in mm : 19.20...20.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm: 600

Aneroid pressure h: 800

Del.quantity : 229.0...231.0

1000 : (226.0...234.0)

Spread cm3 : 5.00

1000 : (9.00)

RATED SPEED

1st version

Setting point:

Speed rpm : 600

M19

Rack travel in mm : 20.0 Testing: 1st rack travel in: 12.70 Speed rpm : 1095...1110 2nd rack travel in: 4,00 rpm : 1150...1180 Speed 4th rack travel in: 1300 Speed rpm : 0.00...1.50LOW IDLE 1 Setting point w/out bumper spring ripm : 300 Rack travel in mm: 6.0 Speed rom : 300 Rack travel in mm : 5.80...6.20 Rack travel in mm : 2.00 : 360...400 Speed rpm TORQUE CONTROL Dimension a mm : 0.40 nd speed rpm : 1050 Rack travel in m: 13.60...13.80 2nd speed : 700 COM 3rd speed Rack travel in m: 14.10...14.30 Aneroid/Altitude Compensator Test 1st version Setting Speed rom : 600 Pressure hPa : 800 Rack travel mm : 13.60...13.80 Measurement Speed 1/min: 600 1st pressure hPa : 300 Rack travel in m: 11.20...11.40 2nd pressure hPa : 600 Rack travel in m: 13.10...13.30 3rd pressure hPa : 1000 Rack travel in m: 13.70...13.80 4th pressure hPa : 1100 Rack travel in m: 13.90...14.10 5th pressure hPa : -Rack travel in m: 10.20...10.50 START CUT-OUT Speed 1/min : 220 (240) FUEL DELIVERY CHARACTERISTICS 1st version Aneroid pressure h: 1500

rpm : 1050

Speed

N20

Del.quantity cm3/: 229.0...233.0 1000 s: (226.0...236.0) Spread cm3 : 8.00 1000 s: (12.0) Aneroid pressure h: 1500 Speed rpm : 800 Del.quantity cm3/: 244.0...247.0 1000 s: (241.0...250.0) Spread cm3 : 8.001000 s: (12.0) Aneroid pressure h: -Speed rpm : 500 Del.quantity cm3/ : 146.0...148.0 1000 s: (143.0...151.0) cm3 : 8.00 Spread 1000 s: (12.0) BREAKAWAY 1st version 1mm rack travel less than full load rack tr: 12.70 rpm : 1095...1110 Speed STARTING FUEL DELIVERY Speed rpm : 100 Del.quantity cm3/: 240.0...260.0 1000 s: (236.0...264.0)

Remarks:

* Increase in control-rod travel with respect to setting at least 0.1 mm

Note inst. in remarks column

: PER 5.0 B Test scheet Edition : 16.03.93 replaces : 20.07.87 Calibrating oil : ISO-4113

Injection pump : VE4/11F1500R266-1 Type number : 0 460 414 042

Customer Part-No. :

Customer-specific information Customer : PERKINS

Engine : MARINE NA 3000

TEST BENCH REQUIREMENTS

Calibrating oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 022

Openina

Pressure bar: 130.00...133.00

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00 mm: 450 x Length

Start of delivery mm: 0.5 Prestroke

(from BDC): +0.02(0.04)

Indicator setting

Piston stroke mm: 1.47 Outlet.

Injection-pump setting values Test specifications in parentheses

Timing-device travel

1/min: 1100 Speed

Setting value mm: 2.40...2.80

Supply-pump pressure

Speed 1/min: 1100

Setting value bar: 4.90...5.50

Full-load del. w/out charge press.:

1/min: 600 Speed

Del. quantity cm3/

1000s.: 23.00...24.00

cm3/: 3.5 Dispersion

1000s.: (3.5)

Low-idle speed regulation

1/mir: 350 Speed

Del. quantity cm3/

1000s.: 11.00...15.00

Del. quantity cm3/: 3.0 1000s.: (3.0)

Full-load speed regulation

1/min: 1600 Speed

Del. quantity cm3/

1000s.: 12.00...18.00

Start:

1/min: 100 Speed

Del. quantity cm3/: 70.00...100.00 mind 1000s.: 70.00

mind

Inspection-pump test specifications Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500

TD travel rnm: 3.70...4.50

mm: (3.40...4.80)

1/min: 1100 3rd speed

TD travel

mm: 2.40...2.80 mm: (1.90...3.30)

4th speed 1/min: 700

TD travel mm: 0.40...1.20

mm: (0.10...1.50)

1/min: 1350 5th speed

TD travel mm: 3.40...4.20

mm: (3.10...4.50)

Supply-pump pressure characteristic:

1/min: 700 1st speed

Supply-pump

bar: 3.50...4.10 pressure

1/min: 1100 2nd speed

Supply-pump

bar: 4.90...5.50 pressure

3rd speed 1/min: 1500

Supply-pump bar: 6.40...7.00 pressure Overlow quantity at overflow valve: 1/min: 600 1st speed : 41.70...83.40 cm3/10s: (26.70...98.40) 1/min: <u>1</u>500 Overflow quantity 2nd speed Overflow : 55.60...139.00 cm3/10s: (40.60...154.00) quantity Delivery-quant. and breakaway char.: 3rd speed 1/min: 1650 Det. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00)
5th speed 1/min: 1600
9el. quantity cm3/: 12.00...18.00
1000s.: (10.00...20.00)
9th speed 1/min: 1500 Del. quantity cm3/: 47.00...50.00 1**000**s.: (45.50...51.50) 1/min: 1100 10th speed Del. quantity cm3/: 47.50...50.50 1000s.: (46.00...52.00) 1/min: 600 12th speed Del. quyntity cm3/: 23.00...24.00 1000s.: (21.00...26.00) Mech. shutoff: Mech. Abstellung: 1st speed 1/min: 1500 Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: -Electr. shutoff: 1/min: 350 1st speed Del. quantity cm3/: 0.00...3.00 1000s.: (0.00...3.00) Shutoff electromagnet volt: 12 Idle delivery: 1st speed 1/min: 350 Del. quantity cm3/: 11.00...15.00 1000s.: (9.00...17.00) cm3/: 3.0 Dispersion 1000s.: (3.0) 1/min: 400 2nd speed Del. quantity cm3/: 3.00...9.00 1000s.: (1.50...10.50)

1/min: 460

Del. quantity cm3/: 0.00...5.00 1000s.: (0.00...5.00) Automatic starting fuel delivery: 2nd speed 1/min: 400 Del. quantity cm3/: 24.50...39.50 1000S.: MAX.39.5 4th speed 1/min: 100 Del. quantity cm3/: 70.00...100.00 1000s.: MIN.70.00 Shutoff electromagnet: Cut-in min voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation K mm: -KF mm: K-OT MS1 mm: 1.60 SVS max. mm: 3.8 Remarks:

3rd speed

Note inst. in remarks column

Test scheet : SOF Edition : 15.03.93 replaces : 02.07.92 Calibrating oil : ISO-4113

: VE4/11F2000R342 Injection pump Type number : 0 460 414 067

Customer Part-No. :

Customer-specific information Customer : SOFIM

Engine : 8140.07.2700

TEST BENCH REQUIREMENTS

Calibrating-oil return temp.

with thermometer : 40.00...48.00 Electronically : 42.00...50.00

Inlet press., bar: 0.30...0.40

Calibrating nozzle-holder

assembly : 1 688 901 027

Opening

bar: 250.00...253.00 Pressure

Perforated-plate

diameter mm: 0.5

Test inj. tubing : 1 680 750 073

Outside diameter : 6.00 x Wall thickness : 2.00 x Length mm: 450

Start of delivery

Prestroke mm: 0.3

(from BDC): (+-0.02(0.04))

Injection pump setting values Test specifications in parentheses

Timing-device travel

Speed 1/min: 1100

Setting value mm: 3.10...3.50

Shutoff

electromagnet Volt: 12

Supply-pump pressure

1/min: 1100 Speed

Setting value bar: 5.70...6.30

Shutoff

electromagnet Volt: 12

Full-load del. with charge press.:

1/min: 525

Del. quantity cm3/

1000s.: 27.00...28.00 F

Shutoff

electromagnet Volt: 12

Full-load del. w/out charge press.:

1/min: 1100

Del. quantity cm3/

1000s.: 54.00...55.00 E

Shutoff

electromagnet Volt: 12 Dispersion cm3/: 3.51000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 350

Del. quantity cm3/

1000s.: 10.50...14.50

Shutoff

electromagnet Volt: 12 Del. quantity cm3/: 3.0 1000s.: (3.5)

Full-load speed regulation

1/min: 2300 Speed

Del. quantity cm3/

1000s.: 18.00...22.00

Shutoff

electromagnet Volt: 12

Start:

Speed 1/min: 100

Del. quantity cm3/: 40.00...80.00

mind 1000s.: 40.00

Shutoff

electromagnet Volt: 12

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

1/min: 1100 Charge press hPa: 12

Inj. -qty. cm3/

difference 1000s.: -13.3...15.3 #

Shutoff

electromagnet Volt: 12

SP pressdif.measurement	+
pompa di mandata (FP)	+ Delivery-quant. and breakaway char.:
1.Speed 1/min: 1100	+
Supply pump	1.
pressure	+ 2nd speed 1/min: 2450
difference bar: -0.100.30#	+ Shutoff
Shutoff	
	electromagnet Volt: 12
electromagnet Volt: 12	† Del. quantity cm3/: 0.005.00
	+ 1000s.: -
Inspection pump test specifications	+ 5th speed 1/min: 2300
Test specifications in parentheses	+ Shutoff
	+ electromagnet Volt: 12
Timing-device characteristic:	† Del. quantity cm3/: 18.0022.00
	+ 1000s.: (15.5024.50)
2nd speed 1/min: 1500	+ 8th speed 1/min: 2200
TD travel mm: 4.104.90	+ Shutoff
mm: (3.905.10)	+ electromagnet Volt: 12
Shutoff	+ Del. quantity cm3/: 32.0040.00
electromagnet Volt: 12	1000s.: (30.0042.00)
3rd speed 1/min: 1100	- -
	9th speed 1/min: 2000
TD travel mm: 3.103.50	+ Shutoff
mm: (2.703.90)	+ electromagnet Volt: 12
Shutoff	+ Del. quantity cm3/: 48.0053.00
electromagnet Volt: 12	+ 1000S.: (47.0054.00) D
4th speed 1/min: 600	+ 10th speed 1/min: 1500
TD travel mm: 0.601.40	+ Shutoff
mm: (0.401.60)	+ electromagnet Volt: 12
Shutoff	Del. quantity cm3/: 53.2058.20
electromagnet Volt: 12	10005.: (52.2059.20)
	+ 12th speed 1/min: 525
Supply-pump pressure characteristic:	Shutoff
Supply pulip pressure character istit.	1
1st shood 1/mins 400	electromagnet Volt: 12
1st speed 1/min: 600	bel. quyntity cm3/: 27.0028.00
Supply-pump	† 1000S.: (24.0031.00) F
pressure bar: 4.104.70	† 18th speed 1/min: 1100
Shutoff	+ Shutoff
electromagnet Volt: 12	+ electromagnet Volt: 12
2nd speed 1/min: 1100	+ Del. quantity cm3/: 54.0055.00
Supply-pump	† 1000s.: (51.0058.00) E
pressure bar: 5.706.30	+
Shutoff	+ Mech. shutoff:
electromagnet Volt: 12	1
3rd speed 1/min: 1500	+ Electr. shutoff:
Supply-pump	
pressure bar: 6.907.50	1st speed 1/min: 350
Shutoff	
electromagnet Volt: 12	bel. quantity cm3/: 0.003.00
etectronagnet vott. 12	† 1000s.: -
Output and an improved the control of	
Overlow quantity at overflow valve:	† Idle delivery:
4.5 4/-: 525	
1st speed 1/min: 525	+ 1st speed 1/min: 350
Shutoff	+ Shutoff
electromagnet Volt: 12	+ electromagnet Volt: 12
Overflow : 69.50111.20	+ Del. quantity cm3/: 10.5014.50
quantity cm3/10s: (55.50125.20)	10005.: (8.5016.50)
2nd speed 1/min: 2000	+ Dispersion cm3/: 3.0
Shutoff	10005.: (3.5)
electromagnet Volt: 12	2nd speed 1/min: 600
Overflow : 83.40180.70	+ Shutoff
quantity cm3/10s: (69.40194.70)	L Company of the comp
quartery (III)/ (05: 307.40(74.70)	+ electromagnet Volt: 12

Del. quantity cm3/: 0.00...2.00 1000s.: -3rd speed 1/min: 400 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 0.00...5.00 1000s.: -1/min: 300 5th speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 26.00...36.00 1000s.: (25.00...37.00) Load-dependent start of delivery: Inj. -qty.dif.measurement: 3rd speed 1/min: 1100 Inj.-qty. cm3/: -16.5..24.5 *difference 1000s.: -Shutoff electromagnet Volt: 12 5th speed 1/min: 1100 Inj.-qty. cm3/: MAX. ..8.00 " difference 1000s.: -Shutoff electromagnet Volt: 12 TD-travel dif.measurement: correttore anticipo iniezione (SV): 1/min: 1100 1st speed : -0.40..0.60 * TD-travel difference mm: -Shutoff electromagnet Volt: 12 3rd speed 1/min: 1100 TD-travel : -0.0...0.80 " difference Shutoff electromagnet Volt: 12 Automatic starting fuel delivery: 1/min: 350 1st speed Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.00...60.00 1000s.: (40.00...60.00) 2nd speed 1/min: 450 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 10.00...40.00 1000s.: (10.00...40.00) 4th speed 1/min: 100 Shutoff electromagnet Volt: 12 Del. quantity cm3/: 40.00...80.00 1000s.: (40.00...80.00)

Shutoff electromagnet: Cut-in miri voltage : 10.0 Rated voltage : 12.0 Mounting and assembly dimensions: Designation K mm: -KF mm: K-OT MS mm: 0,0...1,2SVS max. mm: 3,5 mm: 7,2 HBA stroke Remarks: F = Adjustment point for low full-load delivery E = Fuel-delivery adjustment point in HBA range. (Correction by way of HBA adjusting screw). D = Adjustment point for high fullload delivery